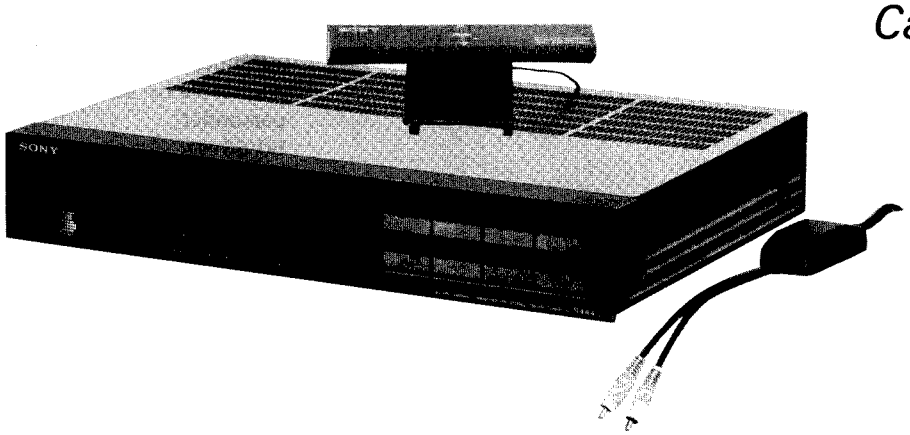
ST-S444ES

SERVICE MANUAL

US Model
Canadian Model
AEP Model
UK Model
E Model



SPECIFICATIONS

FM tuner section

Tuning range 87.5 MHz - 108 MHz
Antenna terminals
75 ohms, unbalanced
Intermediate frequency
10.7 MHz

	AEP, UK model (at 40 kHz deviation)	US, Canadian, E model (at 75 kHz deviation)
Sensitivity	at 46 dB quieting 17.3 dBf, 2 μV (mono) 37.9 dBf, 22.5 μV (stereo)	at 50 dB quieting 16.8 dBf, 1.8 μV (mono) 37.9 dBf, 22.5 μV (stereo)
Usable sensitivity	10.3 dBf, 0.9 μV (IHF) 0.8 μV (S/N = 26 dB)	10.3 dBf, 0.9 μV (IHF)

Signal-to-noise ratio	85 dB (mono) 82 dB (stereo)	91 dB (mono) 88 dB (stereo)
Harmonic distortion at 1 kHz	Mono : 0.03 % (WIDE), 0.05 % (NARROW) Stereo : 0.04 % (WIDE), 0.06 % (NARROW)	
IM distortion	Mono : 0.03 % (WIDE), 0.05 % (NARROW) Stereo : 0.04 % (WIDE), 0.06 % (NARROW)	
Separation at 1 kHz	60 dB	
Frequency response	40 Hz - 12.5 kHz ±0.2 dB 30 Hz - 15 kHz $^{+0.2}_{-0.5}$ dB	30 Hz - 15 kHz $^{+0.2}_{-0.5}$ dB
Selectivity	at 300 kHz 30 (WIDE)/57 (NARROW) dB	at 400 kHz 60 (WIDE)/90 (NARROW) dB

Capture ratio 1.0 dB
AM suppression ratio 65 dB
Image response ratio 120 dB
IF response ratio 120 dB

— Continued on next page —

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY SHADING AND MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

LES COMPOSANTS IDENTIFIÉS PAR UNE TRAME ET UNE MARQUE ⚠ SUR LES DIAGRAMMES SCHÉMATIQUES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPLÉMENTS PUBLIÉS PAR SONY.

MICROFILM

FM STEREO/FM-AM TUNER

SONY®

AUD

Spurious response ratio 120 dB
RF intermodulation 88 dB (IHF)
Muting threshold Approx. 29 dBf, 8 μV
Auto tuning threshold Approx. 29 dBf, 8 μV
Output level/impedance at 75 kHz deviation
750 mV, 620 ohms
Cal tone 400 Hz, 50 % mod

AM tuner section

Tuning range AEP, UK, E model:
531 - 1,602 kHz
US, Canadian, E model:
531 - 1,602 kHz (with the AM channel plan selector set at 9 kHz)
530 - 1,610 kHz(with the AM channel plan selector set at 10 kHz)

Antenna LAYOUT-FREE AM antenna
External antenna terminal

Intermediate frequency
450 kHz

Usable sensitivity
LAYOUT-FREE AM antenna
300 μV/m (at 999 or 1,000 kHz)
External antenna
30 μV (at 999 or 1,000 kHz)

Signal-to-noise-ratio
54 dB

Harmonic distortion
0.3 %

Selectivity AEP, UK model:
35 dB
US, Canadian, E model:
35 dB (9 kHz), 38 dB (10 kHz)

Image response ratio
42 dB (at 999 or 1,000 kHz)

Auto-tuning threshold
Approx. 1 mV/m

General

System
PLL quartz-locked digital synthesizer system
FM stereo, FM/AM super-heterodyne tuner.

Power requirements
AEP model: 220 V ac (or 240 V ac adjustable by authorized Sony personnel), 50/60 Hz
UK model: 240 V ac (or 220 V ac adjustable by authorized Sony personnel), 50 Hz
US, Canadian model: 120 V ac, 60 Hz
E model: 120, 220 or 240 V ac adjustable, 50/60 Hz

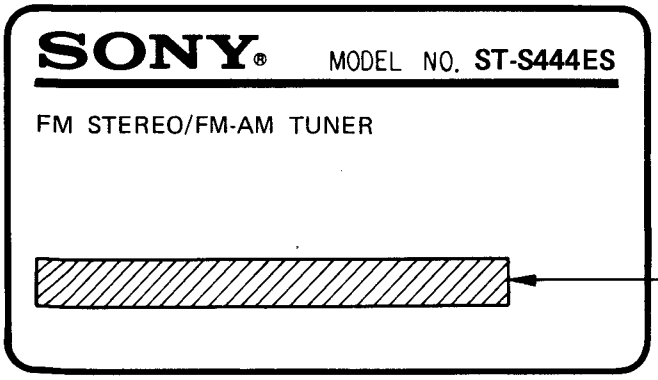
Power consumption
18 watts

Dimensions Approx. 430 × 80 × 340 mm (w/h/d)
(17 × 3 1/4 × 13 1/2 inches)
including projecting parts and controls

Weight Approx. 4.4 kg (12 lbs 21 oz) net

While the information given is true at the time of printing, small production changes in the course of our company's policy of improvement through research and design might not necessarily be indicated in the specifications. We would ask you to check with your appointed Sony dealer if clarification on any point is required.

– MODEL IDENTIFICATION –
(Specification Label)



US model:	AC 120V	60Hz	18W
Canadian model:	AC 120V	60Hz	18W
AEP model:	AC 220V ~	50/60Hz	18W
UK model:	AC 240V ~	50/60Hz	18W
E model:	AC 120/220/240V ~	50/60Hz	18W

SAFETY CHECK-OUT (US Model)

After correcting the original service problem, perform the following safety check before releasing the set to the customer:
Check the antenna terminals, metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5mA (500 microamperes). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2 V AC range are suitable. (See Fig. A)

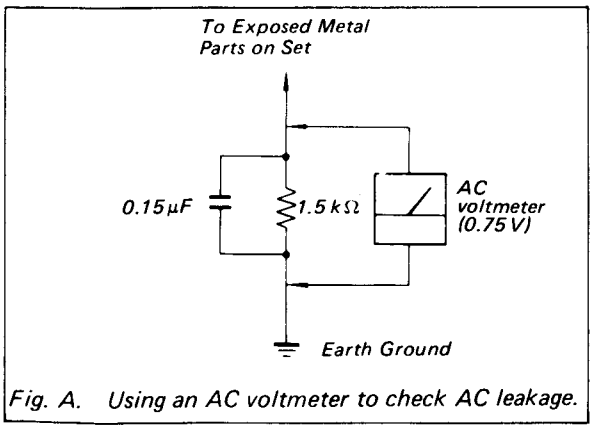


Fig. A. Using an AC voltmeter to check AC leakage.

FEATURES

PLL-CIRCUIT EMPLOYING DIRECT COMPARATOR TECHNOLOGY

The ST-S444ES with its refined Phase Locked Loop (PLL) circuit can tune to a frequency with extraordinary precision.
An IC developed by Sony allows the comparison frequency to be as high as the 50 kHz channel spacing frequency, thus eliminating the tendency of a low comparison frequency, which was formerly generally employed, to slip into the audio range and degrade the signal-to-noise ratio. The local oscillator output can therefore be directly supplied to the programmable divider section without an additional pre-scaler. We call this PLL-circuit technology the Direct Comparator method.
The result is almost rippleless local oscillation, greatly reduced spurious radiation, and an extremely high signal-to-noise ratio.

STATE OF THE ART

Every element of the ST-S444ES is chosen with an eye to optimum reception. Dual-gate MOS FETs in the RF amplifier, and five varactors in the front-end block insure high sensitivity and an excellent spurious response ratio. Four uni-phase filters in the IF amplifier provide high selectivity. The PLL multiplex decoder with a pilot canceler insures a flat frequency response, clear separation and very low distortion.

EFFORTLESS TUNING

Tuning is easy using the digital frequency readout in the frequency display window.
Three methods of tuning are available:
Automatic tuning, in which the entire AM or FM band is scanned automatically until a signal is received.
Manual tuning, in which the AM or FM band can be scanned either rapidly or step-by-step.
Memory preset tuning, in which the frequencies of up to eight stations can be stored. In this mode, this information will be retained when the power is turned off so that you can tune in your favorite station with the push of a button. Various conditions can also be memorized for each individual station to permit one-touch reception. All the memorized settings are displayed in the FL display window.

The SCAN/READ button allows you to scan automatically the preset stations only, listening to each one for a few seconds to check if there is anything you would like to listen to.

A.C.T. (AUDIO CURRENT TRANSFER) CIRCUIT

This tuner employs the A.C.T. technique developed for Sony integrated amplifiers. The A.C.T. circuit design virtually eliminates the problems which the conventional voltage transfer design had: electrical interference between the left and right channels, decreased sound quality, distortion, noise, etc. caused by the fact that both the signal source current and the power supply current flow through the same ground.
This technique insures the tuner's high-quality reception performance.

PROGRAM FUNCTION

Using the Program Function, you can automatically tune in to up to four stations which have been memorized in any sequence you want. Stations will be received one by one as the power is turned on and off by an optional timer. This Program Function enables timer-activated reception or recording of a number of stations as compared to the single station capability of conventional tuners.

OTHER REFINEMENTS

The HI-BLEND switch reduces noise in FM stereo reception.
The ten-step SIGNAL indicator shows the strength of the tuned signal.
The CAL (CALibration) TONE button produces a 400 Hz, 50 % mod. signal (equivalent to 37.5 kHz deviation), which is useful for calibrating the recording level on a tape deck.
The two-pole beat-cut filter is positioned before the multiplex circuit to assure better FM stereo reception.

OPERATING VOLTAGE

Before connecting the unit to the power source, check that the operating voltage of your unit is the same as the local power line voltage.

AEP model operates on 220 V ac (or 240 V ac adjustable by authorized Sony personnel).

UK model operates on 240 V ac (or 220 V ac adjustable by authorized Sony personnel).

The USA and Canada models operate only on 120 V ac.

The E model operates on either 120, 220 or 240 V ac. The voltage selector is located on the rear panel. If the selector must be reset, **disconnect the ac power cord** and turn the selector with a coin so that the arrow mark of the selector points to the proper voltage figure.

PRECAUTIONS

On safety

- Before operating the unit, be sure that the operating voltage of your unit is identical with that of your local power supply.
- Should any liquid or soild object fall into the cabinet, unplug the unit and have it checked by qualified personnel before operating it any further.
- Unplug the unit from the wall outlet if it is not to be used for an extended period of time. To disconnect the cord, pull it out by grasping the plug. Never pull it out by the cord.

On installation

- Do not install the unit in a location near heat sources such as radiators or air ducts, or in a place subject to direct sunlight, excessive dust, mechanical vibration or shock.
- Good air circulation is essential to prevent internal heat build-up in the unit. Place the unit in a location with adequate air circulation.

On operation

- When the unit is not in use, turn the power off to conserve energy and to extend the useful life of your unit.
- Set the PROGRAM switch to OFF when the Program Function is not being used. If this is not done, you cannot tune with the TUNING or station preset buttons.

On cleaning

Clean the cabinet, front and rear panels periodically with a soft dry cloth. If the stains are difficult to remove, use a cloth moistened with a mild detergent solution. Do not use solvents such as alcohol, benzine or thinner, since they will damage the finish.

On repacking

Do not throw away the carton and the packing material. It makes an ideal container to transport the unit in. When shipping the unit for repair work or to another location, repack it as illustrated on the carton box.

For the customers in the USA

For detailed safety precautions, see the leaflet "IMPORTANT SAFEGUARDS".

Note about the AM channel plan selector

This tuner has a two-position AM channel plan selector underneath the right front corner. To tune in AM stations correctly, the selector should be correctly set according to the AM frequency allocation system of your country.

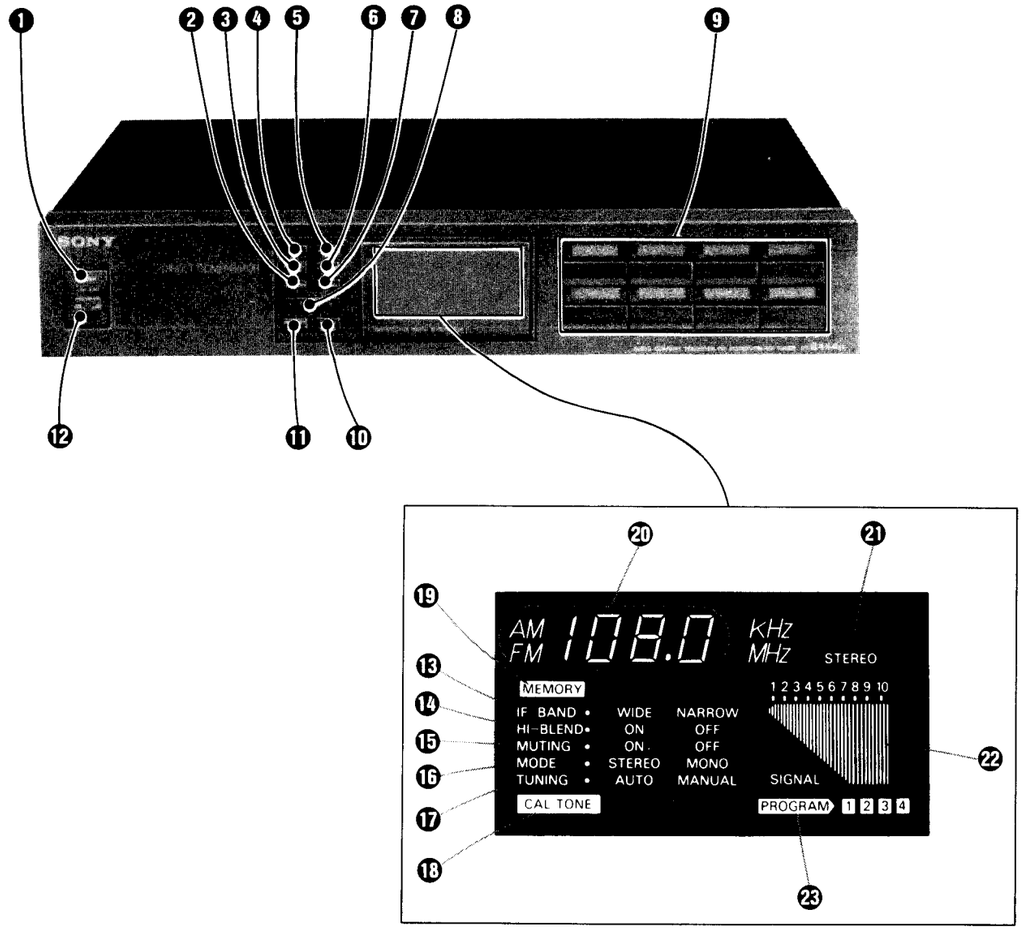
9 kHz: for countries where the frequencies are allocated at intervals of 9 kHz.

10 kHz: for countries where the frequencies are allocated at intervals of 10 kHz, for example, the USA and Canada.

This selector is factory preset. If the AM frequencies are not allocated at intervals in your country, the selector setting should be changed. **Be sure to turn off the power before changing the position of the selector.**

SECTION 1
OUTLINE

1-1. FUNCTION OF CONTROLS



Each number in the text is keyed to that of the photo above.

❶ POWER switch
Depress to turn on the power. To turn the power off, press the switch again.

❷ TUNE MODE button
To tune in a station with the automatic tuning system, press this button so that the TUNING AUTO indicator lights up.
When you want to tune with manual tuning system, press the button again so that the TUNING MANUAL indicator lights up.

❸ MUTING/MODE button
This button serves a dual purpose: it is a muting switch and FM mode selector.
To tune in a strong FM station, press the button so that the MUTING ON and MODE STEREO indicators light up. In this mode, the muting circuit will be activated to eliminate interstation noise while tuning and the FM station will be received in stereo mode.
When you want to tune in a very weak FM staion, press the button again so that the MUTING OFF and MODE MONO indicators light up. The muting circuit will be deactivated and the FM station is received in monaural mode. In this mode, keep the amplifier volume down to avoid speaker damage caused by interstation noise during tuning.

❹ FM/AM selector button
Selects the desired band: FM or AM. The selected band will be indicated in the display window.

❺ IF BAND button
Normally press this button so that the IF BAND WIDE indicator lights up. Low-distortion, hi-fi FM broadcasting sound can be obtained. When there is interference by adjacent stations, press the button so that the IF BAND NARROW indicator lights up. The higher selectivity will improve the reception.

❻ HI-BLEND button
When FM stereo signals are weak and noisy, press this button so that the HI-BLEND ON indicator lights up. This will provide better reception, although the stereo effect at high frequencies is slightly reduced.
To deactivate the high-blend circuit, press the button again. The HI-BLEND OFF indicator will light up.

❼ CAL TONE button
Normally press this button so that the CAL TONE indicator is not lit.
To obtain a 400 Hz, 50 % modulated signal for adjusting the recording level on a cassette deck, press the button. The CAL TONE indicator will light up.
Generally, on cassette decks, adjust the recording level so that the peak meters to −4 dB, and on reel-to-reel tape decks the peak level meters deflect as close as possible to 0 dB. However, depending on the broadcast programs or the tapes you use, some further adjustments may be necessary. You can determine the most appropriate recording level for your tape deck after several trials, using the suggested levels as a starting point.
To deactivate the cal tone circuit, press the CAL TONE button again.

❽ TUNING button
Press either side of this button to change the frequency. Press the left side (-) to go to a lower frequency and the right side (+) to go to a higher.
During automatic tuning: Press to start automatic frequency scanning. The frequencies below or above that shown on the display window will be scanned automatically until a signal is received. To resume scanning, press the button again.
During manual tuning: Press and keep the TUNING button depressed to change the frequency continuously until the figures in the frequency display window approach the desired frequency. The frequency figures will change rapidly. To change the frequency slowly (in 0.05 MHz steps) to tune in a station accurately, press the button and release immediately.
When the frequency figures reach the end of the tuning range, the frequency will then be scanned from the opposite end of the tuning range.

❾ Station preset buttons and station identification windows
To call up a memorized station, press the appropriate button.
Station labels (supplied) identifying memorized stations can be placed in the station identification windows above the buttons.

❿ SCAN/READ button
This button has a dual purpose. With the PROGRAM switch set to OFF, it works as a memory SCAN button and with the PROGRAM switch set to ON, as a program READ button.
SCAN button: Press to automatically scan the stations memorized on the station preset buttons.
READ button: By pushing this button, the programmed station order can be checked.

⓫ MEMORY/SET button
This button has a dual purpose. With the PROGRAM switch set to OFF, it works as a MEMORY button and with the PROGRAM switch set to ON, as a program SET button.
MEMORY button: Press to memorize the tuned station to a station preset button. The MEMORY indicator will appear in the frequency display window for a few seconds indicating that the preset memory circuit is standing by.
SET button: Press to program the preset stations in the desired order. The MEMORY indicator will appear indicating that the program circuit is standing by.

⓬ PROGRAM switch
To use the program function, set this switch to ON. For ordinary use, be sure to keep the switch in the OFF position.

Display window

⓭ IF BAND indicator
Indicates the setting of the IF BAND button.

⓮ HI-BLEND indicator
Indicates the setting of the HI-BLEND button.

⓯ MUTING indicator
Indicates the setting of the MUTING/MODE button.

⓰ MODE indicator
Indicates the setting of the MUTING/MODE button.

⓱ TUNING indicator
The AUTO indicator shows the automatic tuning mode, and the MANUAL indicator, the manual tuning mode set with the TUNE MODE button.

⓲ CAL TONE indicator
Lights up to show that a 400 Hz calibrating tone signal is provided by the CAL TONE button.

❹ FM/AM selector button
Selects the desired band: FM or AM. The selected band will be indicated in the display window.

❺ IF BAND button
Normally press this button so that the IF BAND WIDE indicator lights up. Low-distortion, hi-fi FM broadcasting sound can be obtained. When there is interference by adjacent stations, press the button so that the IF BAND NARROW indicator lights up. The higher selectivity will improve the reception.

❻ HI-BLEND button
When FM stereo signals are weak and noisy, press this button so that the HI-BLEND ON indicator lights up. This will provide better reception, although the stereo effect at high frequencies is slightly reduced.
To deactivate the high-blend circuit, press the button again. The HI-BLEND OFF indicator will light up.

❼ CAL TONE button
Normally press this button so that the CAL TONE indicator is not lit.
To obtain a 400 Hz, 50 % modulated signal for adjusting the recording level on a cassette deck, press the button. The CAL TONE indicator will light up.
Generally, on cassette decks, adjust the recording level so that the peak meters to −4 dB, and on reel-to-reel tape decks the peak level meters deflect as close as possible to 0 dB. However, depending on the broadcast programs or the tapes you use, some further adjustments may be necessary. You can determine the most appropriate recording level for your tape deck after several trials, using the suggested levels as a starting point.
To deactivate the cal tone circuit, press the CAL TONE button again.

❽ TUNING button
Press either side of this button to change the frequency. Press the left side (-) to go to a lower frequency and the right side (+) to go to a higher.
During automatic tuning: Press to start automatic frequency scanning. The frequencies below or above that shown on the display window will be scanned automatically until a signal is received. To resume scanning, press the button again.
During manual tuning: Press and keep the TUNING button depressed to change the frequency continuously until the figures in the frequency display window approach the desired frequency. The frequency figures will change rapidly. To change the frequency slowly (in 0.05 MHz steps) to tune in a station accurately, press the button and release immediately.
When the frequency figures reach the end of the tuning range, the frequency will then be scanned from the opposite end of the tuning range.

❾ Station preset buttons and station identification windows
To call up a memorized station, press the appropriate button.
Station labels (supplied) identifying memorized stations can be placed in the station identification windows above the buttons.

❿ SCAN/READ button
This button has a dual purpose. With the PROGRAM switch set to OFF, it works as a memory SCAN button and with the PROGRAM switch set to ON, as a program READ button.
SCAN button: Press to automatically scan the stations memorized on the station preset buttons.
READ button: By pushing this button, the programmed station order can be checked.

⓫ MEMORY/SET button
This button has a dual purpose. With the PROGRAM switch set to OFF, it works as a MEMORY button and with the PROGRAM switch set to ON, as a program SET button.
MEMORY button: Press to memorize the tuned station to a station preset button. The MEMORY indicator will appear in the frequency display window for a few seconds indicating that the preset memory circuit is standing by.
SET button: Press to program the preset stations in the desired order. The MEMORY indicator will appear indicating that the program circuit is standing by.

⓬ PROGRAM switch
To use the program function, set this switch to ON. For ordinary use, be sure to keep the switch in the OFF position.

Display window

⓭ IF BAND indicator
Indicates the setting of the IF BAND button.

⓮ HI-BLEND indicator
Indicates the setting of the HI-BLEND button.

⓯ MUTING indicator
Indicates the setting of the MUTING/MODE button.

⓰ MODE indicator
Indicates the setting of the MUTING/MODE button.

⓱ TUNING indicator
The AUTO indicator shows the automatic tuning mode, and the MANUAL indicator, the manual tuning mode set with the TUNE MODE button.

⓲ CAL TONE indicator
Lights up to show that a 400 Hz calibrating tone signal is provided by the CAL TONE button.

⓳ MEMORY indicator
When the MEMORY/SET button is pressed, "MEMORY" will appear for a few seconds indicating that the memory circuit is standing by..

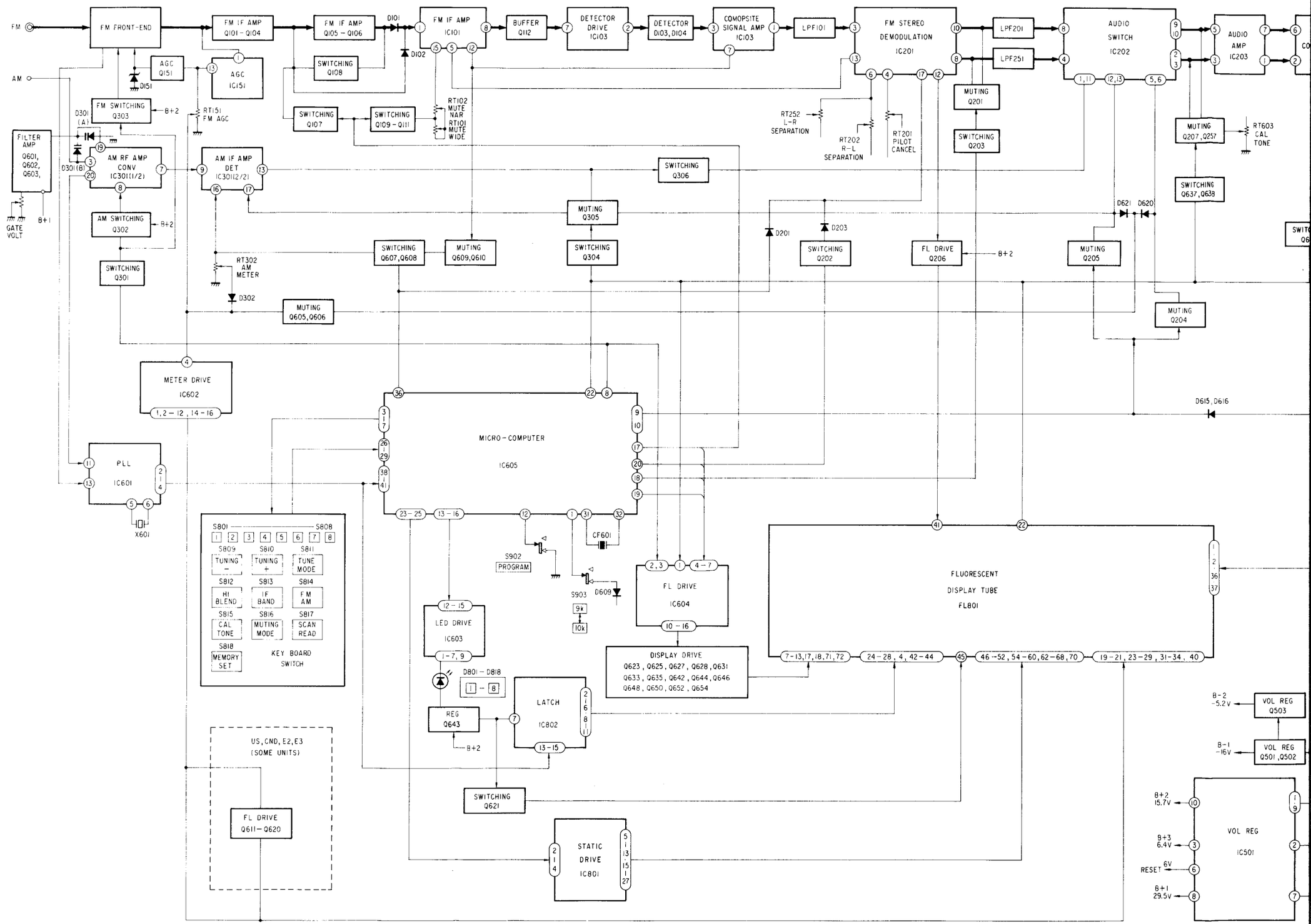
⓴ Band/frequency display
The band and frequency being received is displayed here.

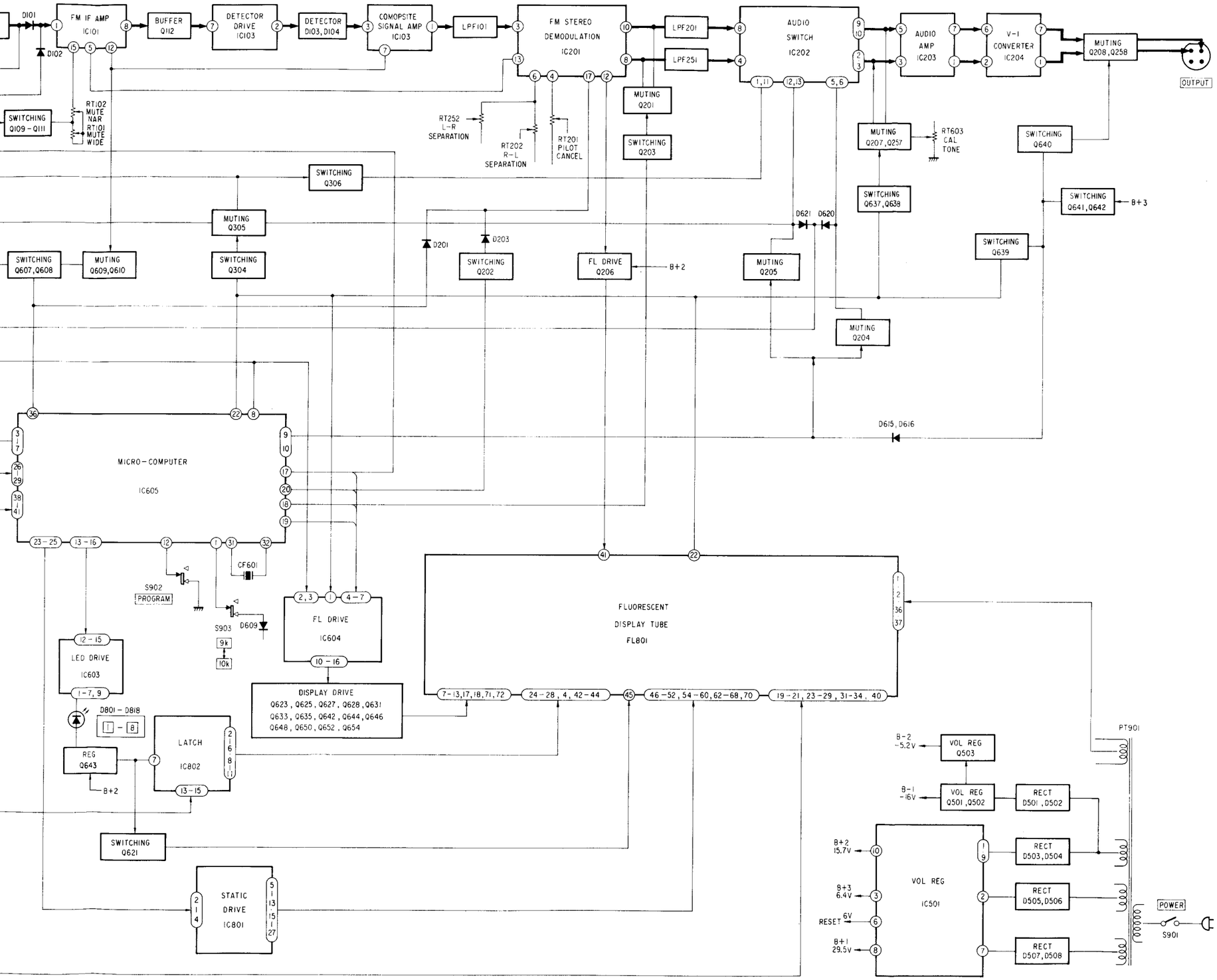
㉑ STEREO indicator
This indicator will light when an FM stereo program of sufficient signal strength is tuned in with the MUTING/MODE button set to STEREO.

㉒ SIGNAL indicator
Indicates the strength of the tuned signal by the amount of indicator illumination. The fullest illumination means the antenna input signal is strong. When the indicator illuminates only at the low end, it means the antenna input signal is weak.
The lines tracing the upper and lower ends of the vertical bars indicate the signal-to-noise ratio curves.

㉓ PROGRAM indicator
With the PROGRAM switch set to ON, the order in the programmed sequence of the station being received is displayed here.

1-2. BLOCK DIAGRAM

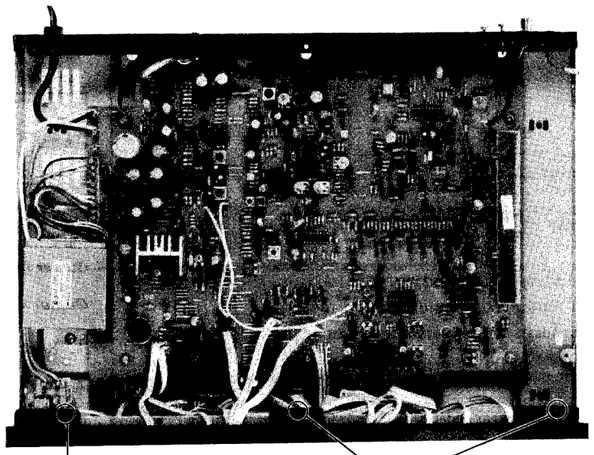



D101
FM IF AMP IC101
D102
BUFFER Q112
DETECTOR DRIVE IC103
DETECTOR D103, D104
COMOPSITE SIGNAL AMP IC103
LPF101
FM STEREO DEMODULATION IC201
LPF201
LPF251
AUDIO SWITCH IC202
AUDIO AMP IC203
V-I CONVERTER IC204
MUTING Q208, Q258
OUTPUT
SWITCHING Q109 - Q111
RT102 MUTE NAR
RT101 MUTE WIDE
RT252 L-R SEPARATION
RT202 R-L SEPARATION
RT201 PILOT CANCEL
MUTING Q201
SWITCHING Q203
MUTING Q207, Q257
RT603 CAL TONE
SWITCHING Q640
SWITCHING Q306
SWITCHING Q637, Q638
SWITCHING Q641, Q642
B+3
MUTING Q305
D621
D620
D201
D203
SWITCHING Q607, Q608
MUTING Q609, Q610
SWITCHING Q304
SWITCHING Q202
FL DRIVE Q206
B+2
MUTING Q205
SWITCHING Q639
MUTING Q204
D615, D616
MICRO-COMPUTER IC605
CF601
S902 PROGRAM
S903
9k
10k
D609
FL DRIVE IC604
FLUORESCENT DISPLAY TUBE FL801
LED DRIVE IC603
D801 - D818
REG Q643
LATCH IC802
DISPLAY DRIVE Q623, Q625, Q627, Q628, Q631 Q633, Q635, Q642, Q644, Q646 Q648, Q650, Q652, Q654
SWITCHING Q621
STATIC DRIVE IC801
PT901
B-2 -5.2V
VOL REG Q503
B-1 -16V
VOL REG Q501, Q502
RECT D501, D502
B+2 15.7V
B+3 6.4V
RESET 6V
B+1 29.5V
VOL REG IC501
RECT D503, D504
RECT D505, D506
RECT D507, D508
POWER
S901

SECTION 2
DISASSEMBLY

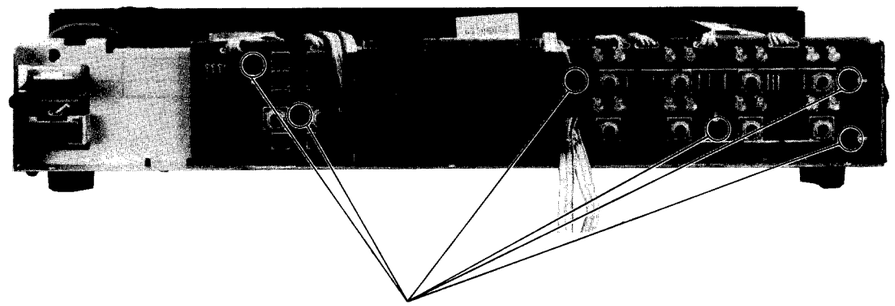
CASE REMOVAL
Remove four case screws.

PANEL ASSY

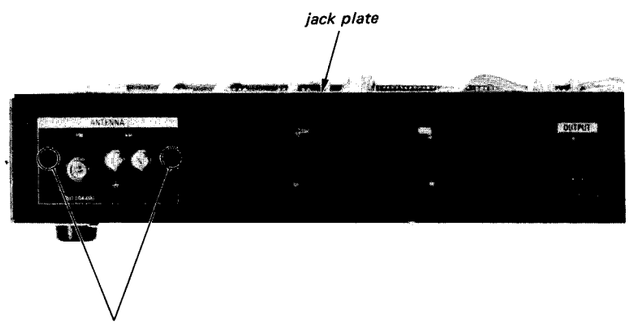


Remove screws at both top and bottom sides.

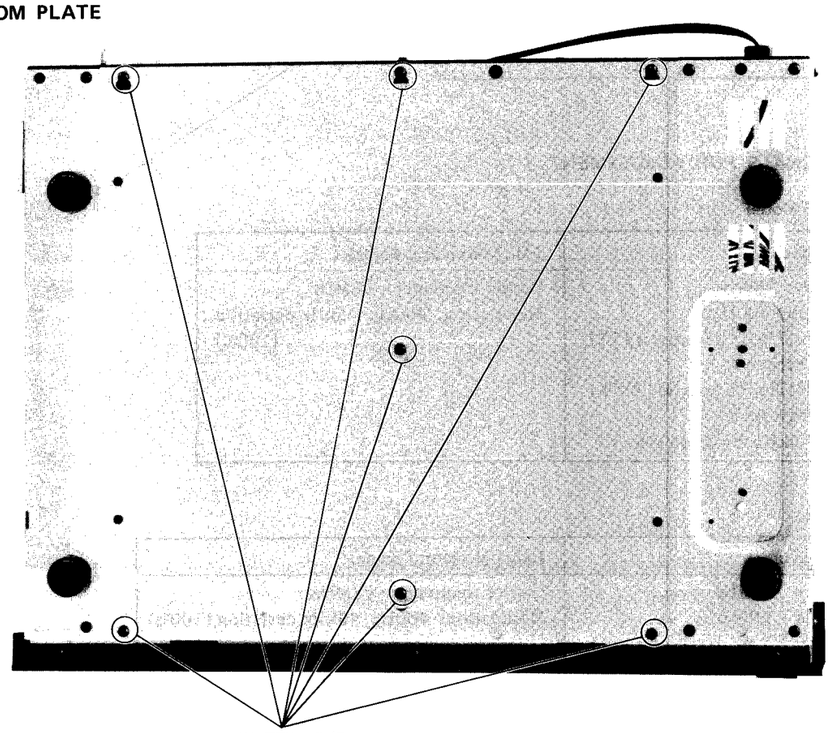
DISPLAY BOARD



TERMINAL BOARD



BOTTOM PLATE



Tuner board can be checked by removing the bottom plate.

SECTION 3
ADJUSTMENTS

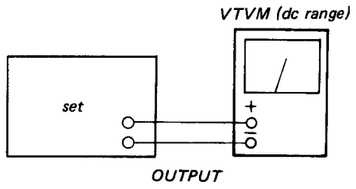
FM SECTION

Setting:

Band: FM

CAL TONE Level Adjustment

Setting:



Procedure:

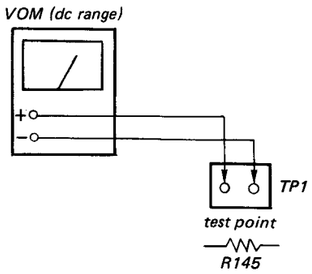
1. Press CAL TONE switch.
2. Adjust RT603 for −6dB (0.39V) reading on VTVM.

Discriminator Adjustment

A) Primary Side (NULL)

- **Procedure**

1.



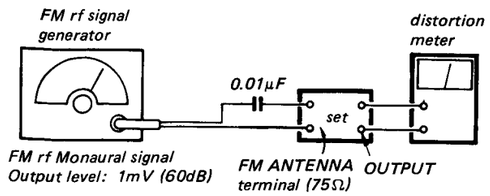
2. Detune the set by pushing the TUNING (+, −) button.
3. Turn the core (primary side: Black) of IFT103 for 0V reading on VOM.

Note: When the ceramic filter is replaced, these adjustments should be made.

B) Secondary Side (DISTORTION)

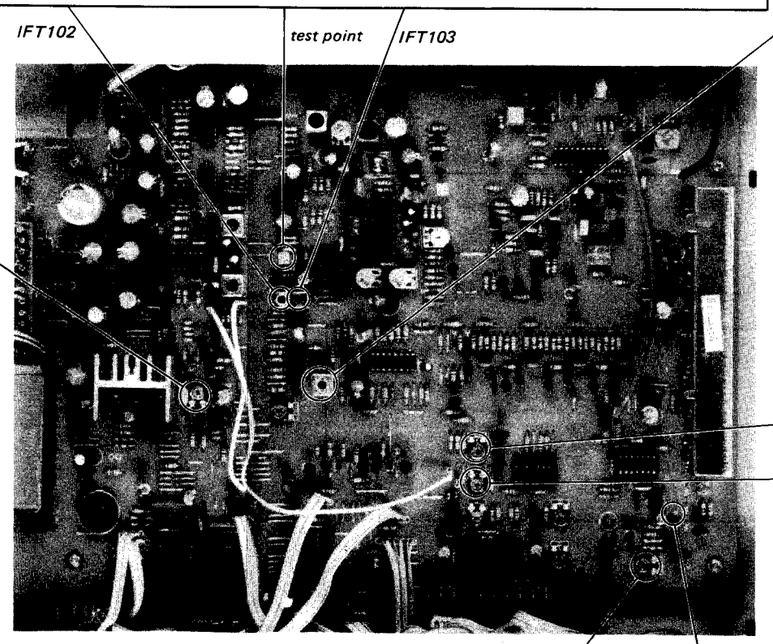
- **Procedure:**

IF BAND: WIDE
MODE: MONO



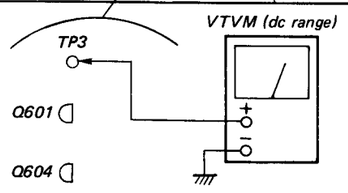
Turn the core (secondary side: Red) of IFT102 for minimum distortion reading on the distortion meter.

Note: Repeat both secondary and primary sides adjustments several times.
Confirm minimum distortion for NARROW IF BAND.



Gate Voltage Adjustment

Adjust RT601 so that gate voltage of Q601 is 1.8V (±0.1V) at 87.5MHz.

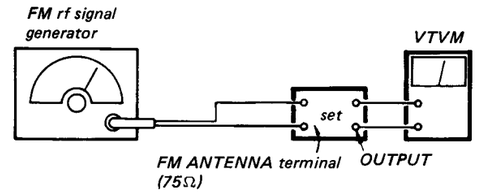


Muting Width Adjustment

Setting:

MUTING/MODE switch: ON

Procedure:



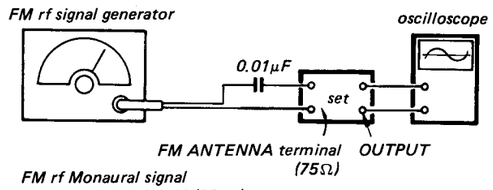
Carrier frequency: *98MHz (US, Canadian) ±40 – ±65kHz*
**(AEP, G-AEP, UK, E) ±25 – ±40kHz*
Output level: *1mV (60dB)*

1. Receive 98MHz signal.
2. With a carrier frequency of 98MHz [+40 to +65kHz]*, adjust IFT101 so that output signal is obtained.
3. With a carrier frequency of 98MHz [−40 to −65kHz]*, make sure of output signal indication.
4. When necessary, repeat above steps so that output signal is obtained at same frequency detuning point to both plus and minus directions within 10kHz.

FM Muting Level Adjustment

Setting:

IF BAND: WIDE



Procedure:

1. Mode: MUTING ON
2. Tune the set to 98MHz by pressing the TUNING button (+, −) and adjust the output level of signal generator at 22dB (12.6μV).
3. Turn RT101 (WIDE) at the position where the waveform suddenly appears on the oscilloscope.
4. Mode: MUTING OFF
5. Turn RT102 (NARROW) at the position where the waveform suddenly appears on the oscilloscope.

STANDARD SIGNALS FOR ADJUSTMENT:

US, Canadian, E Model

FM rf Stereo Signal	FM rf Monaural Signal
Carrier frequency: 98MHz Modulation: Audio 400Hz, 33.75kHz deviation (45%) Subchannel 33.75kHz deviation (45%) Pilot 19kHz 7.5kHz deviation (10%)	Carrier frequency: 98MHz Modulation: 400Hz, 75kHz deviation (100%)

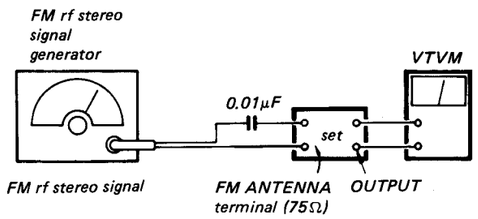
AEP, UK Model

FM rf Stereo Signal	FM rf Monaural Signal
Carrier frequency: 98MHz Modulation: Audio 400Hz 16.25kHz deviation (40%) Subchannel 16.25kHz deviation (40%) Pilot 19kHz 7.5kHz deviation (19%)	Carrier frequency: 98MHz Modulation: 400Hz, 40kHz deviation (100%)

FM SECTION

Pilot Cancel Adjustment

Procedure:



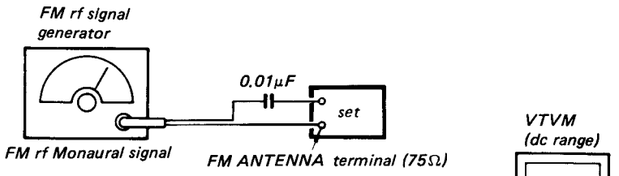
1. Tune the set to 83MHz by pressing the TUNING (+, −) button and turn OFF the audio modulation of the FM stereo signal generator.
2. Adjust RV201 and L201 for minimum reading on the VTVM. Output level of both channels should be well balanced.

Servicing Precaution

The front-end section has been carefully adjusted at the factory. When it is worn out, be sure to exchange it all with new section, because it is difficult to repair.

AGC Adjustment

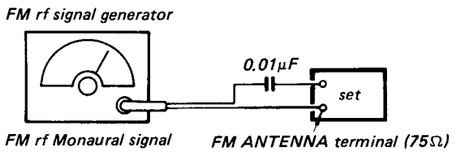
Setting:



Set the output of FM signal generator to 80dB (10mV). Adjust RT151 for 3.6V ±0.1V reading on the VTVM.

Signal Meter Level Adjustment

Setting:



1. Set the output of FM signal generator to 80dB (10mV).
2. Adjust RT152 so that the 1 – 10 indication bars light up on the signal meter.

[WHEN IC151 IS REPLACED]
Continue as follows, A or B.

A. 3. Snip off the adjustment jumper when the signal indicator goes on without any FM input signal. (High-gain IC)

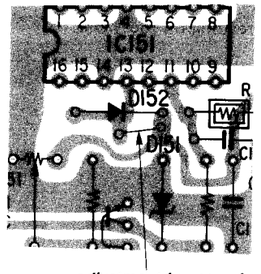
4. Perform Steps 1 and 2 above.

or,

B. 3. Reconnect the adjustment jumper when it has been snipped off at the factory and when the signal indicator does not go on at an input-signal level below the muting threshold. (Low-gain IC)

4. Perform Steps 1 and 2 above.

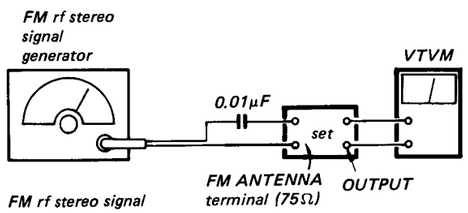
– Adjustment Location –



Stereo Separation Adjustment

Procedure:

IF BAND: WIDE



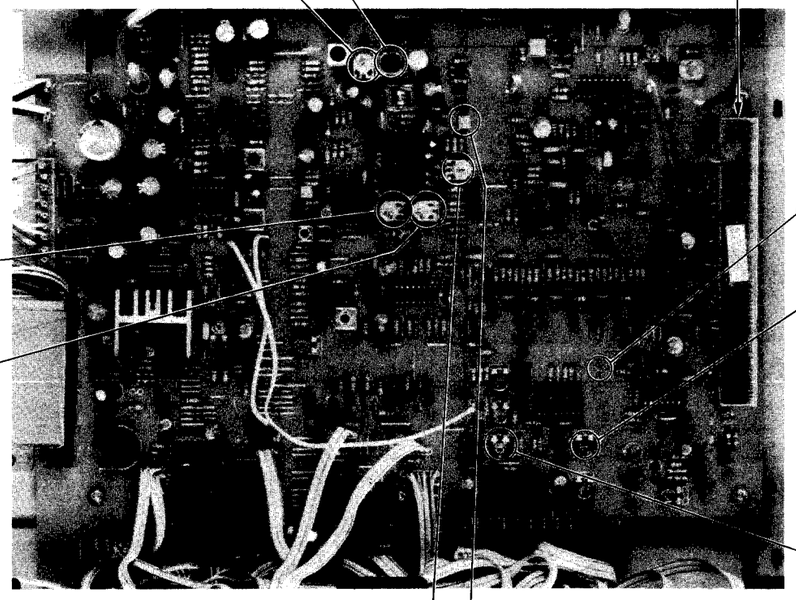
Carrier frequency. 98MHz
Output level: 1mV (60dB)
Mode: Stereo

FM stereo signal generator output channel	VTVM connection	VTVM reading (dB)
L-CH	L-CH	Ⓐ
R-CH	L-CH	Ⓑ Adjust RT202 for minimum reading.
R-CH	R-CH	Ⓒ
L-CH	R-CH	Ⓓ Adjust RT252 for minimum reading.

L-CH Stereo separation: Ⓐ – Ⓑ

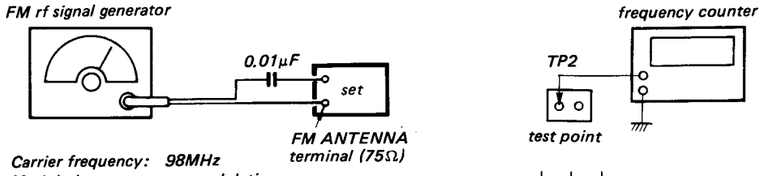
R-CH Stereo separation: Ⓒ – Ⓓ

The separations of both channels should be equal.



VCO Adjustment

Setting:



Carrier frequency: 98MHz
Modulation: no modulation
Output level: 1mV (60dB)

Procedure:

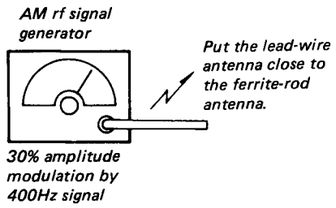
Adjust RT203 for 76kHz ±30Hz on the counter.

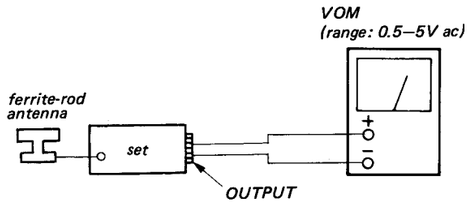
AM SECTION

Setting:

Band: AM

Setup:


AM rf signal generator
Put the lead-wire antenna close to the ferrite-rod antenna.
30% amplitude modulation by 400Hz signal

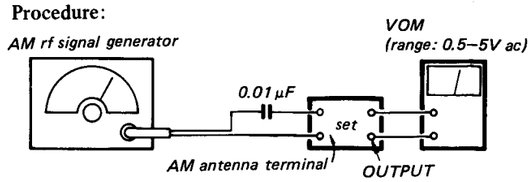


- Repeat the procedures in each adjustment several times, and the frequency coverage and tracking adjustments should be finally done by the trimmer capacitors.

AM IF Alignment

Note: Perform this adjustment together with the AM TRACKING ADJUSTMENT.

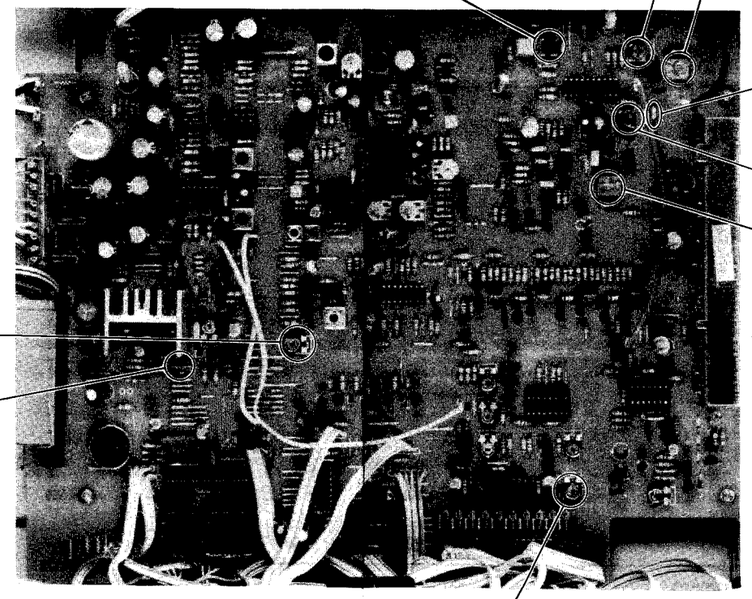
Procedure:



Carrier frequency: 1,400kHz or 1,395kHz
30% amplitude modulation by 400Hz signal
Output level: as low as possible

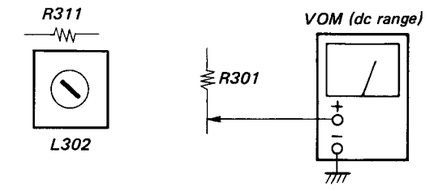
1. Tune the set to 1,400kHz or 1,395kHz and adjust IFT301 for a maximum reading on VOM.
2. Repeat the procedure in adjustment several times.

AM TRACKING ADJUSTMENT	
Adjust for a maximum reading on VOM.	
L301	(US, Canadian, E) ... 600kHz (AEP, UK) ... 603kHz
CT301	(US, Canadian, E) ... 1400kHz (AEP, UK) ... 1395kHz



AM FREQUENCY COVERAGE ADJUSTMENT

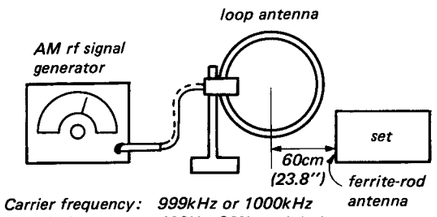
Frequency Display	(US, Canadian, E) ..... 1600kHz (AEP, UK) 1602kHz	(US, Canadian, E) ..... 530kHz (AEP, UK) 531kHz
Voltage at R301	22V	1.8V
Adjustment Parts	CT302	L302



S903 9k/10k switch: 9k (AEP, G-AEP, UK)
10k (US, Canadian, E)

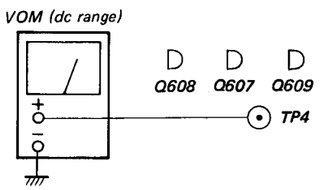
AM Auto Stop Level Adjustment

Procedure:



Carrier frequency: 999kHz or 1000kHz
Modulation: 400Hz, 30% modulation
Output level: 84dB

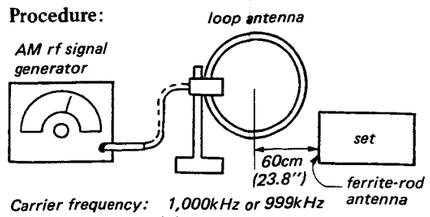
1. Set AM rf signal generator so that the AM antenna input level becomes 58dB/m.
2. Adjust RT602 for 0V dc reading on the VOM.



Note:
Interrupt with each other.
Repeat these adjustments several times at a time.

Signal Indicator Adjustment

Procedure:



Carrier frequency: 1,000kHz or 999kHz
30% amplitude modulation by 400Hz signal
Output level: 94dB

Tune the set to 999kHz or 1000kHz by pressing the MANUAL TUNING switches and adjust RT301 so that all signal elements 1 – 10 light up.

Note: Circled T.P. No.'s coincide with those in mounting and schematic diagrams.

TEST POINTS, WAVEFORMS AND OPERATING VOLTAGES

T.P. No.	Waveform or Voltages
①	5V P-P, 20ms
②	5V P-P, 20ms
③	70mV, 18ms
④	110mV, 18ms
⑤	150mV, 18ms
⑥	240mV, 18ms
⑦	300mV, 18ms
⑧	340mV, 18ms
⑨	240mV, 18ms
⑩	320mV, 18ms
⑪	IF BAND 15V (NAR) 0V (WIDE)
⑫	MUTING MODE 15V ON 0V -3V OFF
⑬	IF BAND 15V (WIDE) 0V (NAR)
⑭	HI-BLEND (FM) 15V ON 0V OFF
⑮	CAL 15V ON 0V OFF
⑯	TUNE MODE 15V AUTO -1V MANUAL
⑰	MUTING (FM) 15V ON 0V OFF
⑱	ALL MODE 18V 0V
⑲	HI-BLEND 15V OFF 0V ON
㉑–㉔	FM/AM 13V AM 1V FM 0V
㉕	FM/AM 13V AM 0.2V FM 0V
㉖–㉘	FM/AM 13V AM 1V FM 0V
㉙	FM IF BAND HI-BLEND TUNE MODE 4.8V, 1ms
㉚–㉜	TUNE MODE CAL MODE TUNING ⊖ MODE MUTING MODE HI-BLEND MODE TUNING ⊕ MODE IF BAND MODE SCAN READ MODE 4.6V, 3.1ms ㉙ – ㉜ button kept pressed
㉝	IF BAND MODE SCAN MODE 2V P-P, 4ms, 2ms, 6ms IF BAND button kept pressed

TEST POINTS, WAVEFORMS AND OPERATING VOLTAGE

T.P. No.	Waveform or Voltages
㉞	IC605 PIN No. 23 3.8V P-P, 0.22ms TUNING button kept pressed
㉟	IC605 PIN No. 22 CAL TONE 3.2V ON 0V OFF
㊱	IC605 PIN No. 25 4V P-P, 2.5ms
㊲	IC605 PIN No. 31 6.2V P-P, 0.25ms
㊳	IC605 PIN No. 34 40mV P-P, 0.25µs
㊴	IC605 PIN No. 35 38mV P-P, 0.25µs
㊵	IC605 PIN No. 32 6.6V P-P, 0.25µs
㊶	IC601 PIN No. 5 1.8V P-P, 0.14µs
㊷	IC601 PIN No. 6 4.8V P-P, 0.14µs
㊸	FRONT END (FM) CV. 21V 108.0MHz 8V 87.5MHz 0V
㊹	IC601 PIN No. 13 810mV P-P, 531kHz, 1µs 640mV P-P, 1,602kHz, 0.5µs
㊺	IC601 PIN No. 11 1.1V P-P (87.5MHz), 0.1µs 1.1V P-P (108.0MHz), 0.08µs

AND OPERATING VOLTAGE

or Voltages	T.P. No.	Waveform or Voltages
N No. 5 1.8V P-P		
I No. 6 4.8V P-P		
ND (FM) CV. 21V 108.0MHz 8V 87.5MHz 0V		
No. 13 810mV P-P 531kHz 640mV P-P 1,602kHz		
No. 11 1.1V P-P (87.5MHz) 1.1V P-P (108.0MHz)		

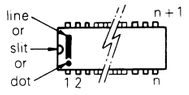
ST-S444ES

SECTION 4
DIAGRAMS

4-1. MOUNTING DIAGRAM
– Conductor Side –

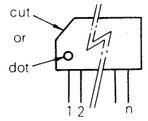
- **Semiconductor Lead Layouts**

CX7925
LA1235
LA1245
LB1494
M54519P
NE5532P
SN74LS145N
TC4066BP
TC9174P
TD6301AP
TL082CP
TL490CN
TMP47C40N-6308
μPC1223C-1
μPC4558C

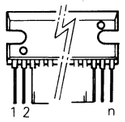


(Top view)

μPC1163H

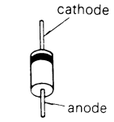


LA5658

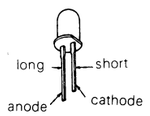


(Marking side view)

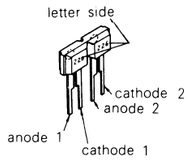
1SS202-1
1T261
10DF2
10E2
HZ4B3
HZ6B1L
HZ16-1L



SEL1710K

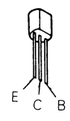


KV1226-F



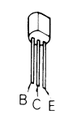
2SK30A
2SK30A-GR3

2SC1362-48

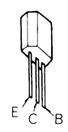


2SK246-GR

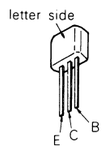
2SC710-13



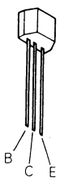
2SA1027R



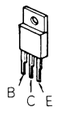
2SC2785



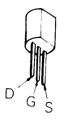
2SC2603
DTA144ES
DTA144WS
DTC124ES

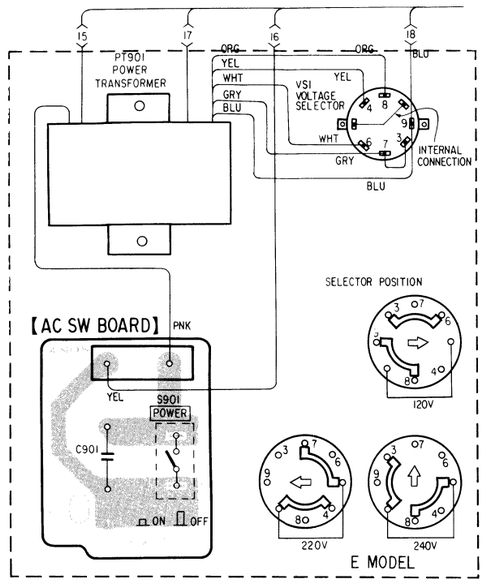


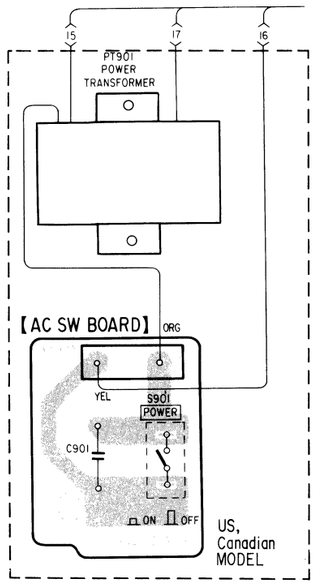
2SA771

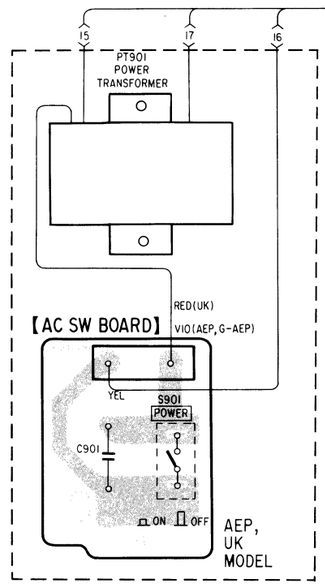


2SK170



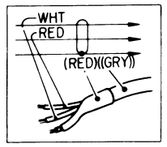






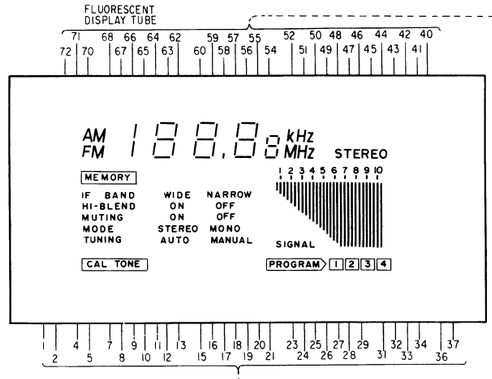
Note:

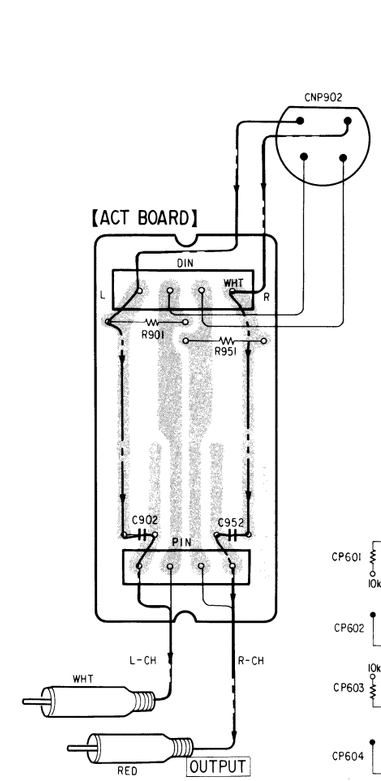
- Color code of sleeving over the end of the jacket.

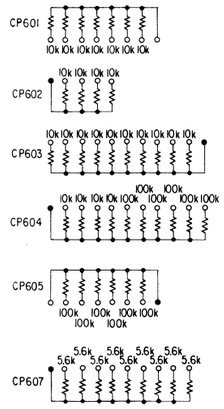


- ○— : parts extracted from the component side.
- [ ]— : indicates side identified with part number.
- ▒▒ : B+ pattern

- ▬▶▬ : signal path
- Refer to pages 19 and 20 for waveforms/voltages at circled red numbers.

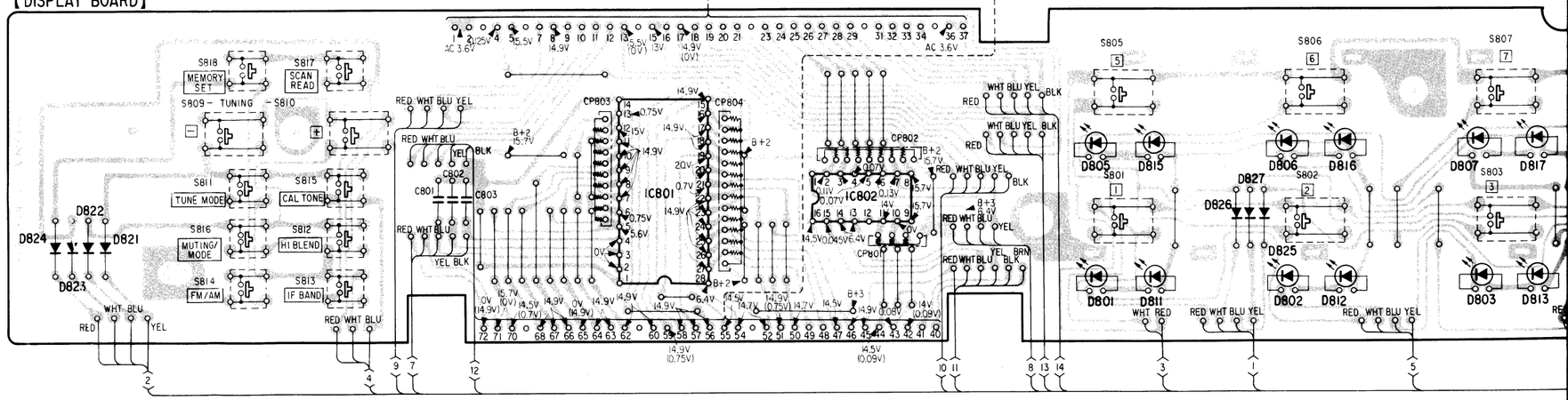


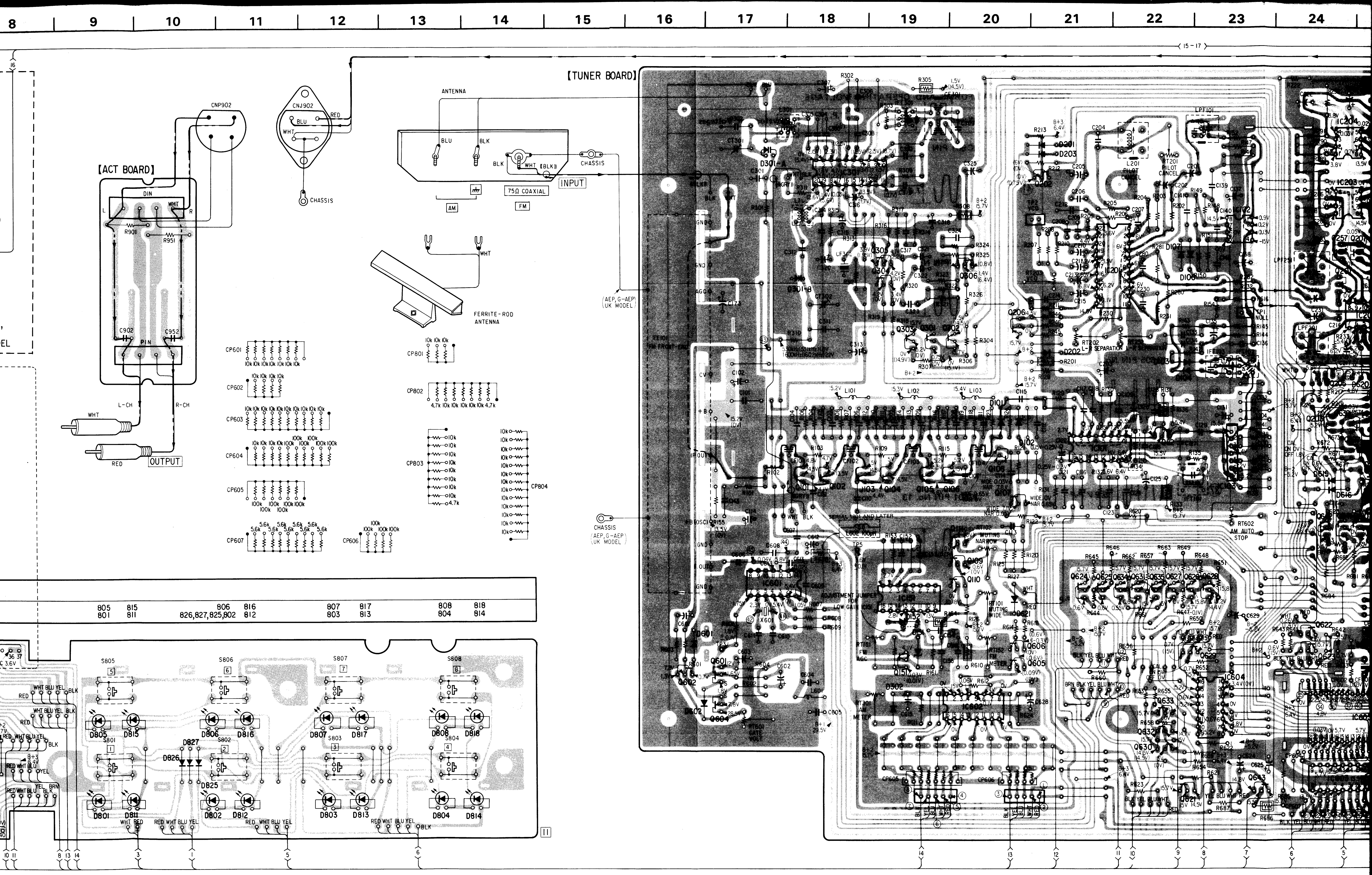




IC	801	802															
D	824,823,822,821								805 801	815 811		806 826,827,825,802	816 812		807 803	817 813	

【DISPLAY BOARD】





8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
【ACT BOARD】
CNP902
DIN
L
WHT
R
R901
R951
C902
C952
PIN
L-CH
R-CH
WHT
RED
OUTPUT
CNJ902
RED
BLU
WHT
CHASSIS
ANTENNA
BLU
BLK
BLK
WHT
(BLK)
CHASSIS
INPUT
AM
75Ω COAXIAL
FM
FERRITE-ROD ANTENNA
(AEP, G-AEP UK MODEL)
CHASSIS
(AEP, G-AEP UK MODEL)
【TUNER BOARD】
FE101 FM FRONT-END
SERIAL 1891 AND LATER
ADJUSTMENT JUMPER FOR LOW GAIN IC151
RT601 GATE VOLT
RT151 FM AGC
RT301 AM METER
RT101 MUTING WIDE
RT102 MUTING NARROW
RT152 FM METER
RT201 PILOT CANCEL
L201 PILOT CANCEL
RT202 L-R SEPARATION
RT203 VCO
TP2 VCO
TP1 NULL
RT602 AM AUTO STOP
LPF101
LPF201
LPF251
IC101
IC102
IC103
IC151
IC201
IC203
IC204
IC301
IC601
IC602
IC604
CP601
CP602
CP603
CP604
CP605
CP606
CP607
CP801
CP802
CP803
CP804
805 815 806 816 807 817 808 818
801 811 826,827,825,802 812 803 813 804 814
S805 S806 S807 S808
S801 S802 S803 S804
D805 D815 D806 D816 D807 D817 D808 D818
D801 D811 D802 D812 D803 D813 D804 D814
D826 D827 D825

〈 15 – 17 〉

【ACT BOARD】

【TUNER BOARD】

CNP902

CNJ902

ANTENNA

75Ω COAXIAL

INPUT

CHASSIS

AM

FM

FERRITE-ROD ANTENNA

DIN

PIN

L-CH

R-CH

WHT

RED

OUTPUT

R901

R951

C902

C952

CP601

CP602

CP603

CP604

CP605

CP606

CP607

CP801

CP802

CP803

CP804

805	815	806	816	807	817	808	818
801	811	826,827,825,802	812	803	813	804	814

S801 S802 S803 S804

D801 D802 D803 D804 D805 D806 D807 D808 D811 D812 D813 D814 D815 D816 D817 D818 D825 D826 D827

FE101 FM FRONT-END

IC101 IC102 IC103 IC151 IC201 IC203 IC204 IC602 IC603 IC604

Q101 Q102 Q103 Q104 Q105 Q106 Q107 Q108 Q109 Q110 Q111 Q151 Q201 Q202 Q205 Q206 Q301 Q302 Q303 Q304 Q305 Q306 Q601 Q602 Q604 Q605 Q606 Q621 Q622 Q623 Q624 Q625 Q626 Q627 Q628 Q629 Q630 Q631 Q632 Q633 Q634 Q635 Q643

D101 D102 D151 D152 D201 D203 D301-A D301-B D302 D601 D602 D621 D622 D623 D624 D625 D626 D627 D628 D629 D630 D631 D632 D633 D634 D635 D636 D637 D638 D639 D640 D641 D642 D643 D644 D645 D646 D647 D648 D649 D650 D651 D652 D653 D654 D655 D656 D657 D658 D659 D660 D661 D662 D663 D664 D665 D666 D667 D668 D669 D670 D671 D672 D673 D674 D675 D676 D677 D678 D679 D680 D681 D682 D683 D684 D685 D686 D687

D201 D202 D203 D204 D205 D206 D207 D208 D209 D210 D211 D212 D213 D214 D215 D216 D217 D218 D219 D220 D221 D222 D223 D224 D225 D226 D227 D228 D229 D230 D231 D232 D233 D234 D235 D236 D237 D238 D239 D240 D241 D242 D243 D244 D245 D246 D247 D248 D249 D250 D251 D252 D253 D254 D255 D256 D257 D258 D259 D260 D261 D262 D263 D264 D265 D266 D267 D268 D269 D270 D271 D272 D273 D274 D275 D276 D277 D278 D279 D280 D281 D282 D283 D284 D285 D286 D287 D288 D289 D290 D291 D292 D293 D294 D295 D296 D297 D298 D299 D300 D301 D302 D303 D304 D305 D306 D307 D308 D309 D310 D311 D312 D313 D314 D315 D316 D317 D318 D319 D320 D321 D322 D323 D324 D325 D326 D327 D328 D329 D330 D331 D332 D333 D334 D335 D336 D337 D338 D339 D340 D341 D342 D343 D344 D345 D346 D347 D348 D349 D350 D351 D352 D353 D354 D355 D356 D357 D358 D359 D360 D361 D362 D363 D364 D365 D366 D367 D368 D369 D370 D371 D372 D373 D374 D375 D376 D377 D378 D379 D380 D381 D382 D383 D384 D385 D386 D387 D388 D389 D390 D391 D392 D393 D394 D395 D396 D397 D398 D399 D400 D401 D402 D403 D404 D405 D406 D407 D408 D409 D410 D411 D412 D413 D414 D415 D416 D417 D418 D419 D420 D421 D422 D423 D424 D425 D426 D427 D428 D429 D430 D431 D432 D433 D434 D435 D436 D437 D438 D439 D440 D441 D442 D443 D444 D445 D446 D447 D448 D449 D450 D451 D452 D453 D454 D455 D456 D457 D458 D459 D460 D461 D462 D463 D464 D465 D466 D467 D468 D469 D470 D471 D472 D473 D474 D475 D476 D477 D478 D479 D480 D481 D482 D483 D484 D485 D486 D487 D488 D489 D490 D491 D492 D493 D494 D495 D496 D497 D498 D499 D500 D501 D502 D503 D504 D505 D506 D507 D508 D509 D510 D511 D512 D513 D514 D515 D516 D517 D518 D519 D520 D521 D522 D523 D524 D525 D526 D527 D528 D529 D530 D531 D532 D533 D534 D535 D536 D537 D538 D539 D540 D541 D542 D543 D544 D545 D546 D547 D548 D549 D550 D551 D552 D553 D554 D555 D556 D557 D558 D559 D560 D561 D562 D563 D564 D565 D566 D567 D568 D569 D570 D571 D572 D573 D574 D575 D576 D577 D578 D579 D580 D581 D582 D583 D584 D585 D586 D587 D588 D589 D590 D591 D592 D593 D594 D595 D596 D597 D598 D599 D600 D601 D602 D603 D604 D605 D606 D607 D608 D609 D610 D611 D612 D613 D614 D615 D616 D617 D618 D619 D620 D621 D622 D623 D624 D625 D626 D627 D628 D629 D630 D631 D632 D633 D634 D635 D636 D637 D638 D639 D640 D641 D642 D643 D644 D645 D646 D647 D648 D649 D650 D651 D652 D653 D654 D655 D656 D657 D658 D659 D660 D661 D662 D663 D664 D665 D666 D667 D668 D669 D670 D671 D672 D673 D674 D675 D676 D677 D678 D679 D680 D681 D682 D683 D684 D685 D686 D687

L101 L102 L103 L151 L201 L301 L601 L602 100μH

LPF101 LPF201 LPF251

CF101 CF102 CF103 CF104 CF301

CT301 CT302

IFT101 IFT102 IFT301

RT101 MUTING WIDE

RT102 MUTING NARROW

RT201 PILOT CANCEL

RT202 L-R SEPARATION

RT203 VCO

RT252 L-R SEPARATION

RT301 AM METER

RT601 GATE VOLT

RT602 AM AUTO STOP

RTI151 FM AGC

RTI152 FM METER

TP1 NULL

TP2 VCO

TP5

X601

L-CH

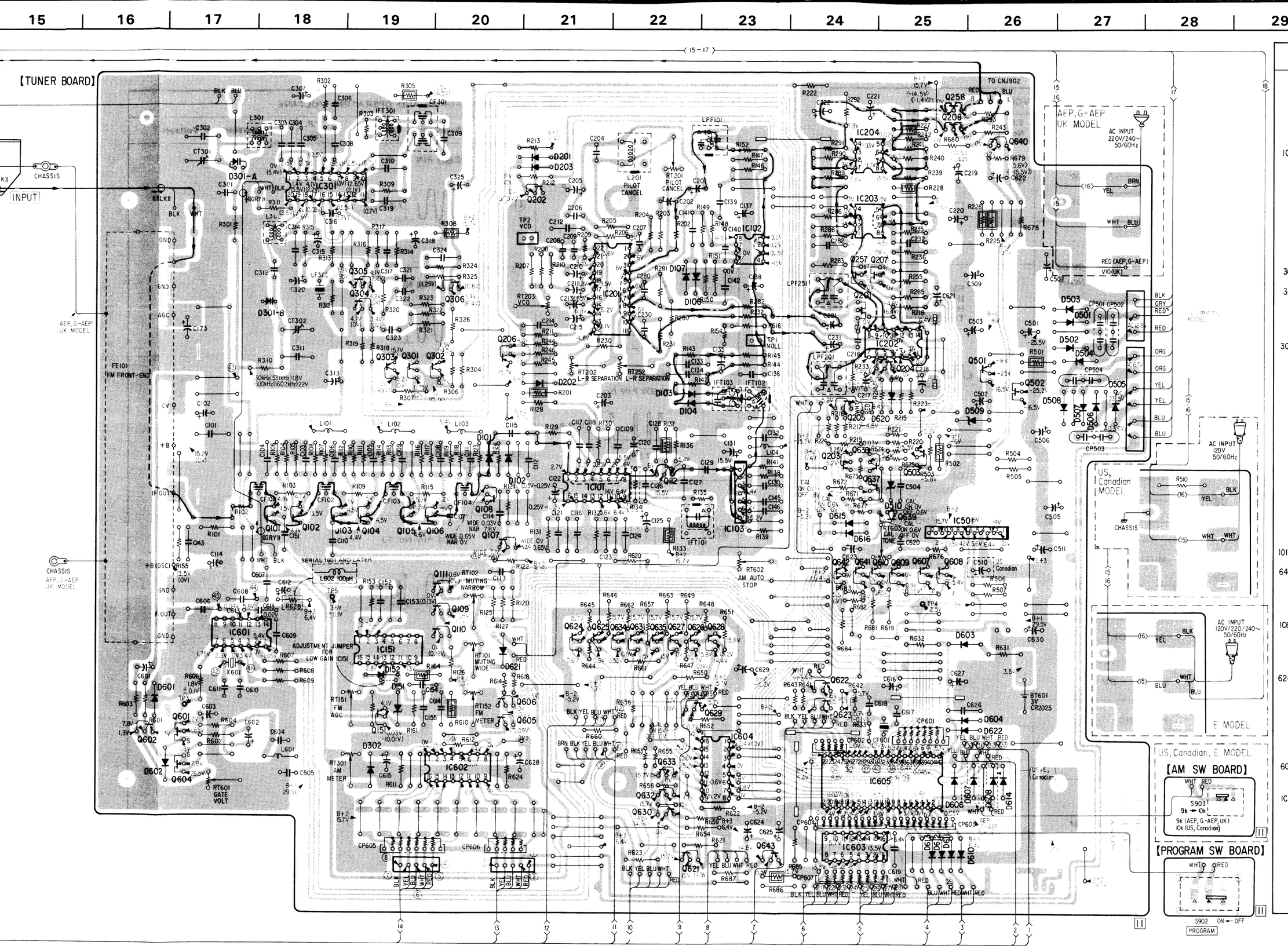
R-CH

OUTPUT

SERIAL 180 AND LATER

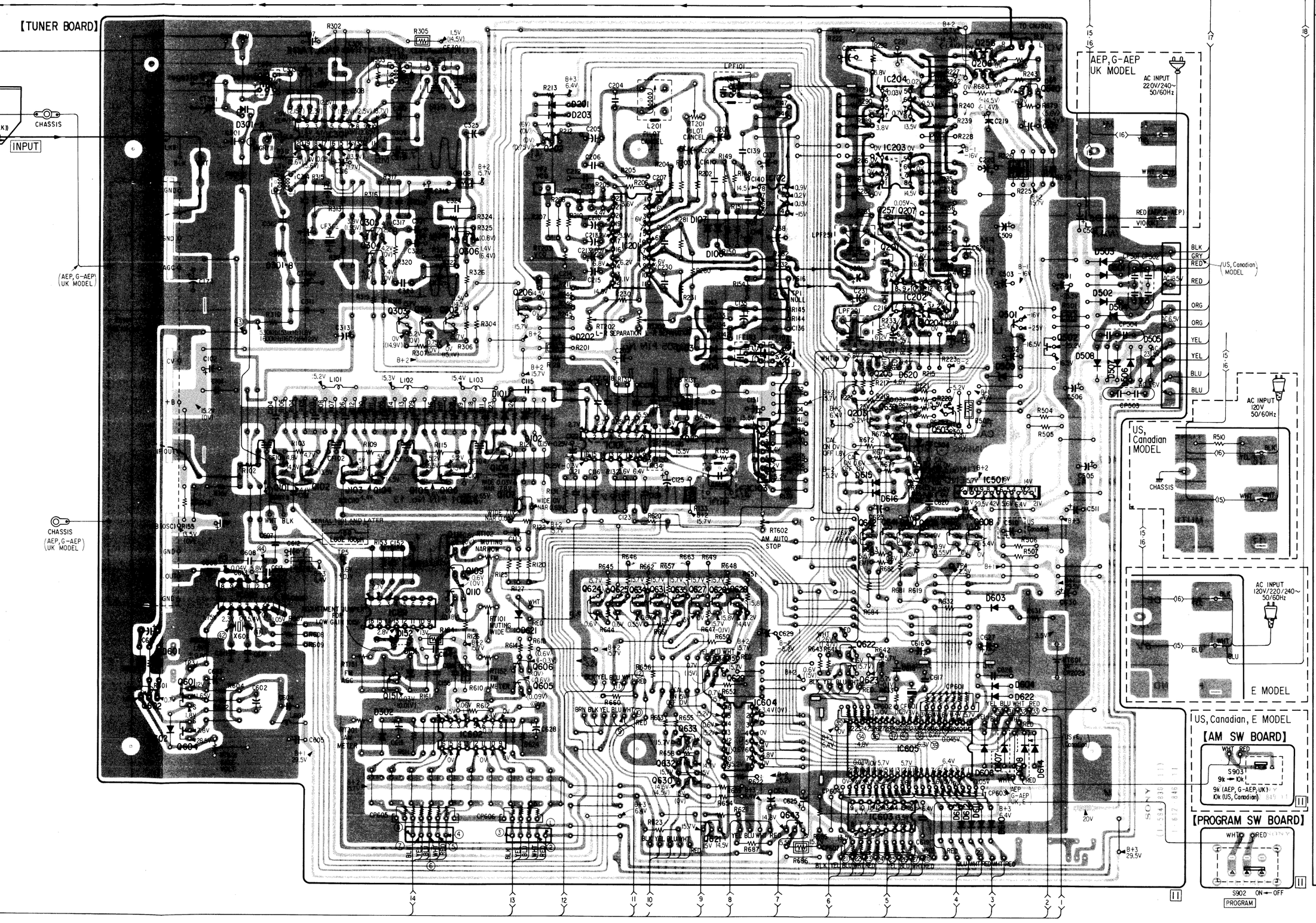
ADJUSTMENT JUMPER FOR LOW GAIN IC151

【TUNER BOARD】



Q・IC	D
258	
208	
640	
IC204	201
	203
IC301 202	301-A
IC102	
257 207	
305 IC201	107,106
201	301-B
304	503
	501
IC202	
206	502
303,301,302,204,501	504
502	202
	103 620
205	104
	508,507,506,505
	509
	101 , 102
	510
112 203 638	
637	
IC101	
108	
639	615
IC103	616
IC501	
101,102,103,104,105,106 107	
642,641,610,609,607	
608	
111	
109	
IC601,110	
IC151	
624,625,634,631,635	921 603
627,626,628	
606 622	
629 623	
	601
	604
602,601	622
IC602 IC604	602 302
633 IC605	
632	606,607,608 614
630	
IC603	
621 643	613,612,611 610

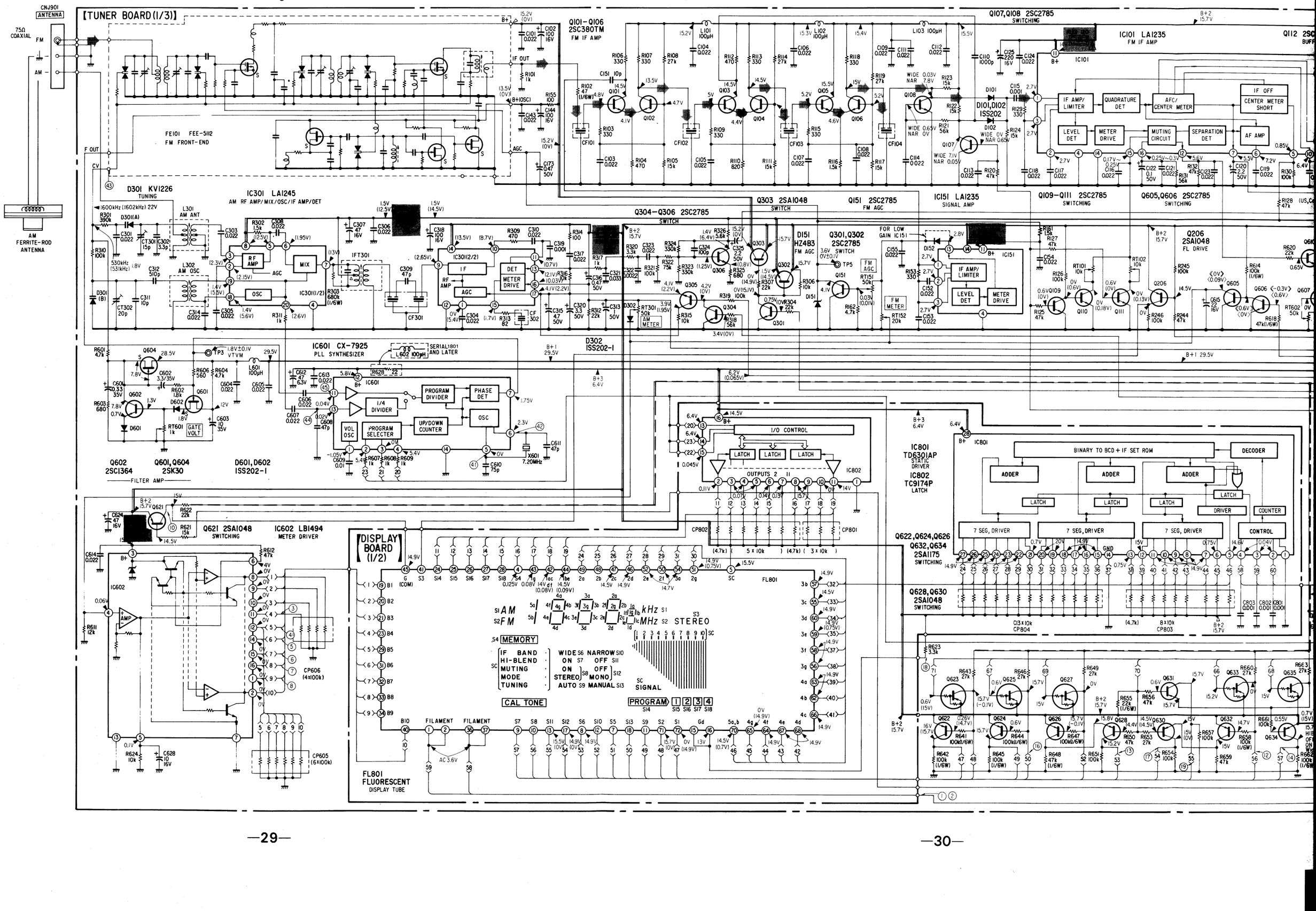
【TUNER BOARD】



Q · IC	D
258 208 640	
IC204	201 203
IC301 202	301-A
IC102	
257 207	
305 IC201 304 201	107,106 301-B 503 501
IC202 206 303,301,302,204,501	502 504
502	202 103 620 104
205	508,507,506,505 509
	101 , 102 510
112 203 638 637	
IC101 108	
639 IC103	615 616
IC501 101,102,103,104,105,106 107 642,641,610,609,607 608	
111 109 IC601,110	
IC151	
624,625,634,631,635 627,626,628	921 603
606 622 629 623	601
	604 622
602,601	
IC602 IC604 633 IC605	602 302
632	606,607,608 614
630	
IC603	
621 643	613,612,611 610

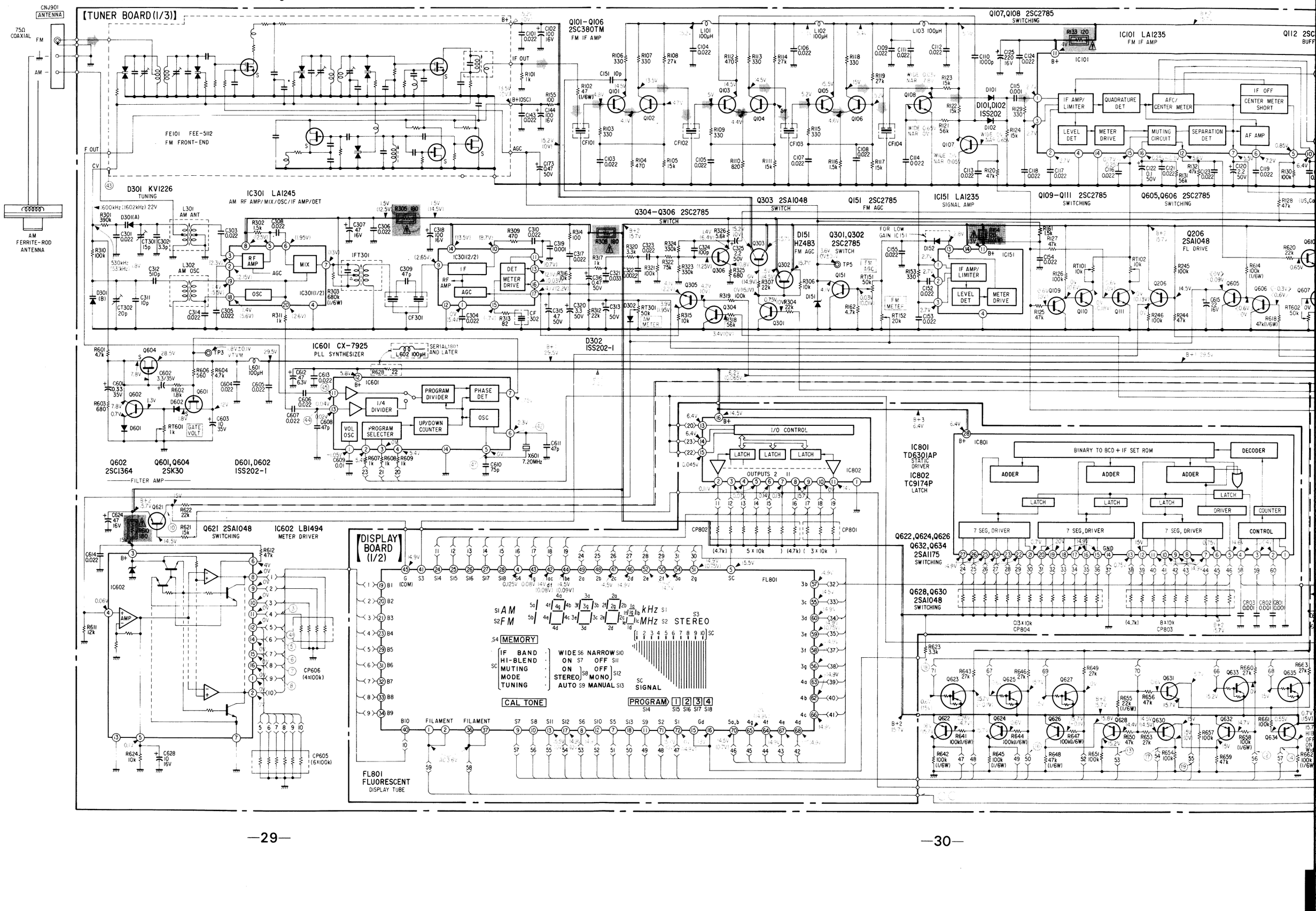
4-2. SCHEMATIC DIAGRAM

See page 34 for NOTE.



4-2. SCHEMATIC DIAGRAM

See page 34 for NOTE.



Q107,Q108 2SC2785
SWITCHING

IC101 LA1235
FM IF AMP

Q112 2SC380TM
BUFFER

IC103 μPC1163H
DISCRI. DRIVER

IC102 μPC4558C
COMP AMP

IC201 μPC1223C-1
MPX DECODER

D106,D107
ISS202

D103,D104 ISS202
FM DETECTOR

Q201 2SK30
Q203 2SA1048
SWITCH

IC151 LA1235
SIGNAL AMP

Q109–Q111 2SC2785
SWITCHING

Q605,Q606 2SC2785
SWITCHING

Q607,Q608,Q610 2SC2785
SWITCHING

Q609 DTC124ES
SWITCHING

Q206 2SA1048
FL DRIVE

Q202 2SC2785
SWITCHING

Q207,Q257 2SK30
MUTING SWITCHING

IC202 TC4066BP
AF SWITCHING

IC203 μPC4558C
AUDIO AMP

IC204 NE5532P
V-I CONVERTER
TL082CP

IC603 SN74LS145N
LAMP DRIVE

IC604 M54519P
FLT DRIVER

Q204,Q205 2SA1048
SWITCH

D615,D616 ISS202-1

Q637 2SC2785
SWITCH

D620,D621 ISS202

D603,D604 ISS202-1

IC801 TD6301AP
STATIC DRIVER

IC802 TC9174P
LATCH

Q622,Q624,Q626 Q632,Q634 2SA1175
SWITCHING

Q628,Q630 2SA1048
SWITCHING

IC605 TMP47C40N-6308
MICRO COMPUTER

Q623,Q625,Q627 Q633,Q635,Q629 DTA144WS
FLT DRIVER

Q638 2SA1048
SWITCHING

Q639,Q641 2SC2785
SWITCHING

Q640,Q642 2SA1048
SWITCHING

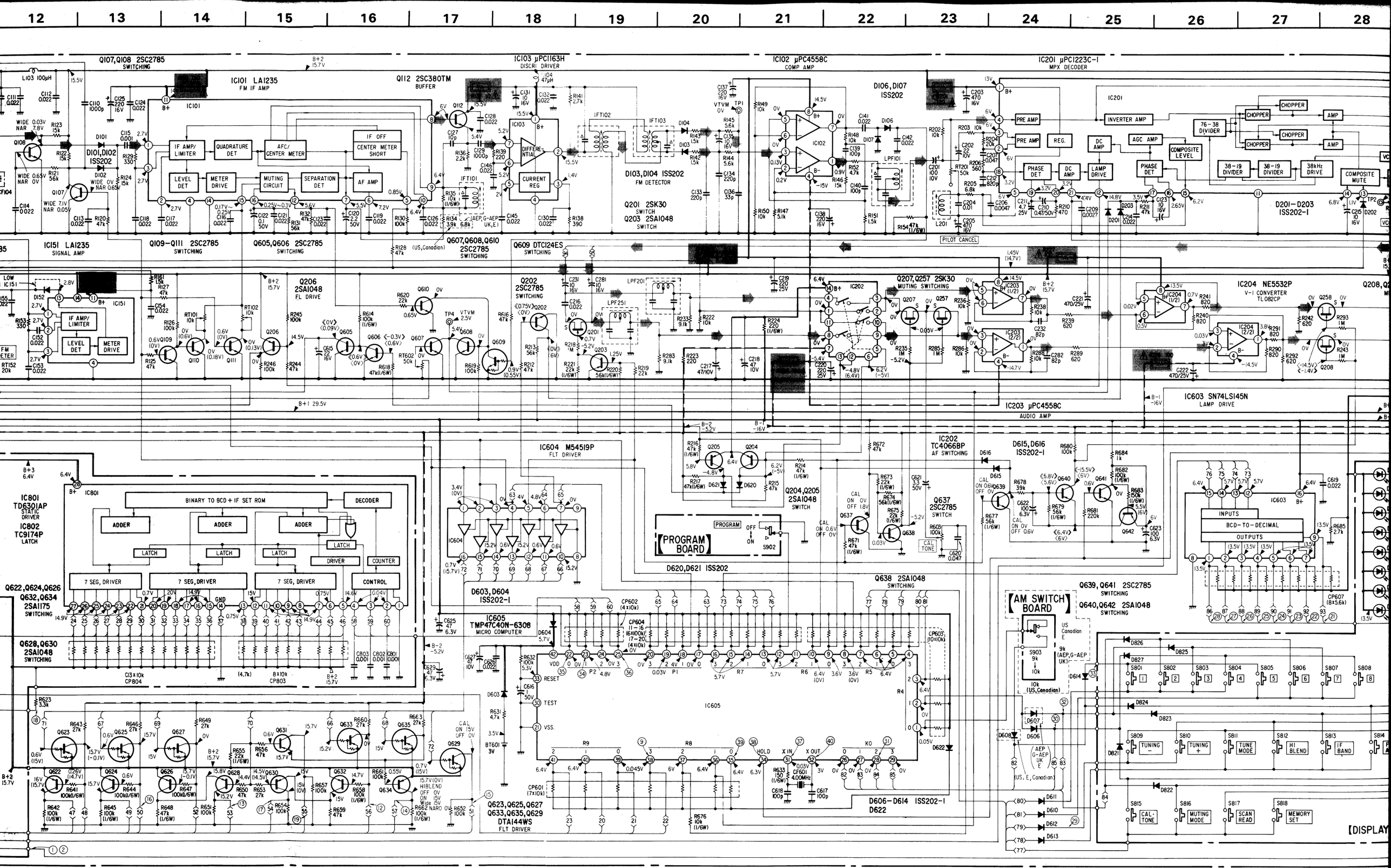
D606–D614 ISS202-1
D622

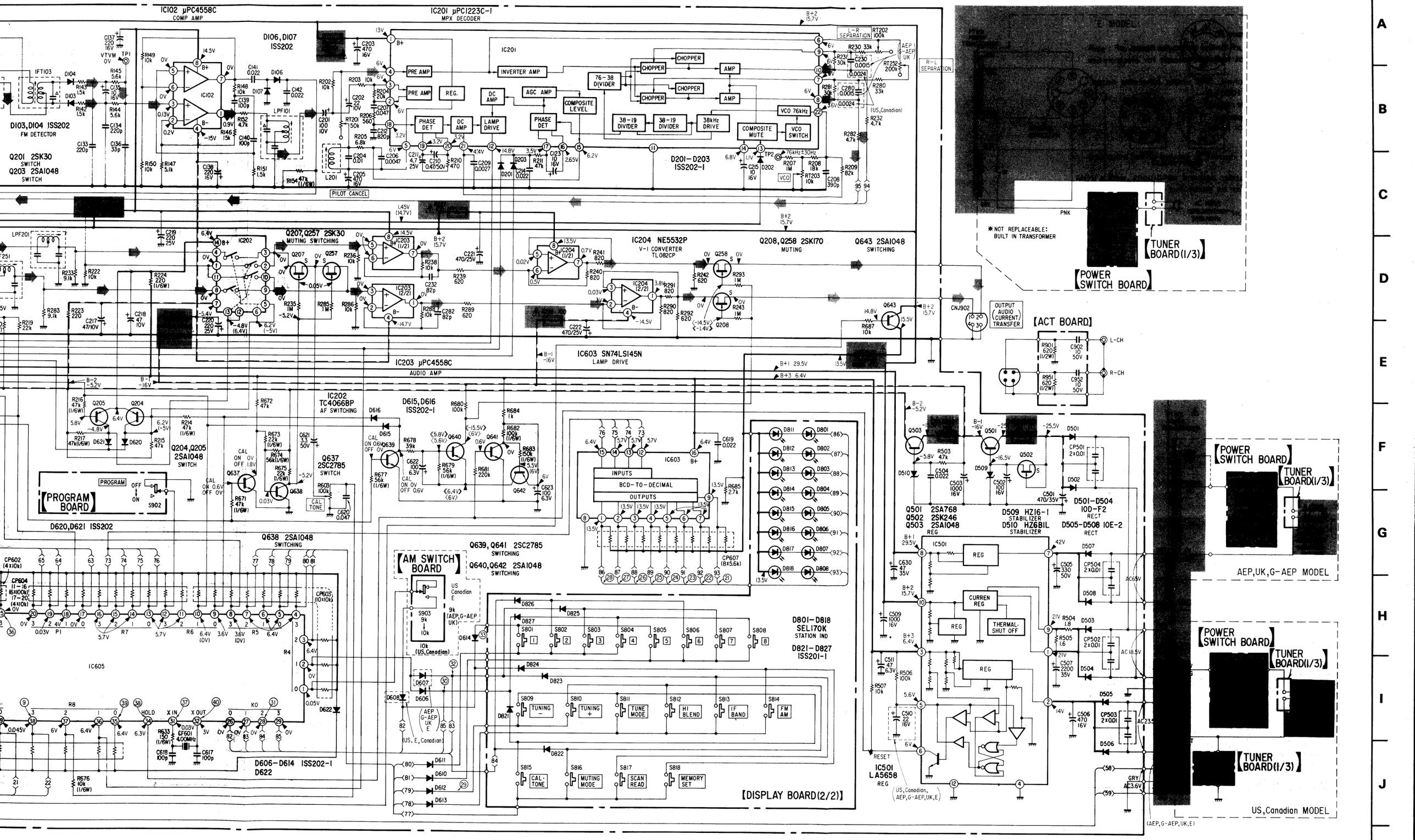
D201–D203 ISS202-1

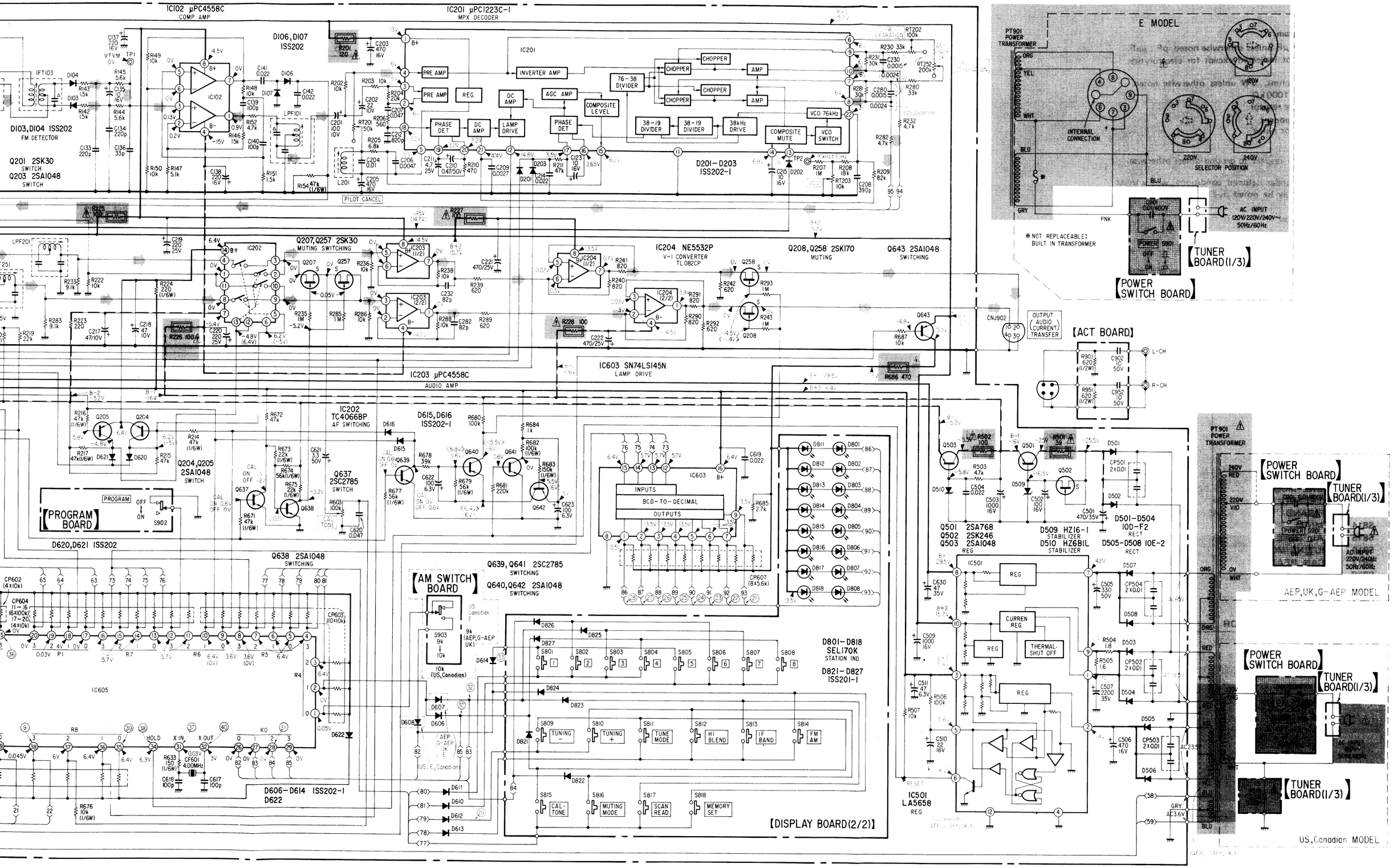
【PROGRAM BOARD】

【AM SWITCH BOARD】

【DISPLAY


12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
Q107,Q108 2SC2785
SWITCHING
IC101 LA1235
FM IF AMP
IC103 μPC1163H
DISCRI DRIVER
Q112 2SC380TM
BUFFER
IC102 μPC4558C
COMP AMP
IC201 μPC1223C-1
MPX DECODER
D106,D107
ISS202
D101,D102
ISS202
D103,D104 ISS202
FM DETECTOR
Q201 2SK30
Q203 2SA1048
SWITCH
IF AMP/ LIMITER
QUADRATURE DET
AFC/ CENTER METER
IF OFF CENTER METER SHORT
LEVEL DET
METER DRIVE
MUTING CIRCUIT
SEPARATION DET
AF AMP
DIFFERENTIAL
CURRENT REG
IFT101
IFT102
IFT103
PRE AMP
REG.
DC AMP
LAMP DRIVE
INVERTER AMP
AGC AMP
COMPOSITE LEVEL
PHASE DET
76-38 DIVIDER
38-19 DIVIDER
38kHz DRIVE
CHOPPER
COMPOSITE MUTE
LPF101
PILOT CANCEL
D201-D203
ISS202-1
IC151 LA1235
SIGNAL AMP
Q109-Q111 2SC2785
SWITCHING
Q605,Q606 2SC2785
SWITCHING
Q607,Q608,Q610 2SC2785
SWITCHING
Q609 DTC124ES
SWITCHING
Q206 2SA1048
FL DRIVE
Q202 2SC2785
SWITCHING
LPF201
LPF251
Q207,Q257 2SK30
MUTING SWITCHING
IC202
IC203 μPC4558C
AUDIO AMP
IC204 NE5532P
V-I CONVERTER
TL082CP
IC603 SN74LS145N
LAMP DRIVE
IC604 M54519P
FLT DRIVER
IC202 TC4066BP
AF SWITCHING
D615,D616
ISS202-1
Q204,Q205
2SA1048
SWITCH
Q637 2SC2785
SWITCH
D620,D621 ISS202
PROGRAM BOARD
PROGRAM
OFF
ON
S902
IC801 TD6301AP
STATIC DRIVER
IC802 TC9174P
LATCH
BINARY TO BCD + IF SET ROM
DECODER
ADDER
LATCH
DRIVER
COUNTER
7 SEG. DRIVER
CONTROL
Q622,Q624,Q626
Q632,Q634
2SA1175
SWITCHING
Q628,Q630
2SA1048
SWITCHING
IC605
TMP47C40N-6308
MICRO COMPUTER
D603,D604
ISS202-1
Q623,Q625,Q627
Q633,Q635,Q629
DTA144WS
FLT DRIVER
Q638 2SA1048
SWITCHING
D606-D614 ISS202-1
D622
Q639,Q641 2SC2785
SWITCHING
Q640,Q642 2SA1048
SWITCHING
AM SWITCH BOARD
S903
9k
10k
(AEP,G-AEP UK)
(US,Canadian)
S801
S802
S803
S804
S805
S806
S807
S808
S809
TUNING -
S810
TUNING +
S811
TUNE MODE
S812
HI BLEND
S813
IF BAND
S814
S815
CAL. TONE
S816
MUTING MODE
S817
SCAN READ
S818
MEMORY SET
D821
D822
D823
D824
D825
D826
D827
D607
D608
D611
D610
D612
D613
D614
(AEP G-AEP UK E)
(US, E, Canadian)
[DISPLAY
[PROGRAM BOARD]
[AM SWITCH BOARD]
—30—
—31—
—32—


IC102 μPC4558C
COMP AMP
IC201 μPC1223C-1
MPX DECODER
DI06, DI07
ISS202
DI03, DI04 ISS202
FM DETECTOR
Q201 2SK30
SWITCH
Q203 2SA1048
SWITCH
IC201
PRE AMP
PRE AMP
REG.
PHASE DET
DC AMP
LAMP DRIVE
DC AMP
AGC AMP
PHASE DET
COMPOSITE LEVEL
INVERTER AMP
CHOPPER
CHOPPER
CHOPPER
CHOPPER
AMP
AMP
76-38 DIVIDER
38-19 DIVIDER
38-19 DIVIDER
38kHz DRIVE
COMPOSITE MUTE
VCO 76kHz
VCO SWITCH
L-R SEPARATION
R-L SEPARATION
PILOT CANCEL
D201-D203
ISS202-1
VCO
(US, Canadian)
* NOT REPLACEABLE: BUILT IN TRANSFORMER
PNK
【TUNER BOARD(1/3)】
【POWER SWITCH BOARD】
IC202
TC4066BP
AF SWITCHING
Q207, Q257 2SK30
MUTING SWITCHING
IC203 μPC4558C
AUDIO AMP
IC204 NE5532P
V-I CONVERTER
TL082CP
Q208, Q258 2SK170
MUTING
Q643 2SA1048
SWITCHING
IC603 SN74LS145N
LAMP DRIVE
D615, D616
ISS202-1
D616
D615
Q639
Q640
Q641
Q642
Q637 2SC2785
SWITCH
Q638 2SA1048
SWITCH
D620, D621 ISS202
【PROGRAM BOARD】
PROGRAM
S902
Q639, Q641 2SC2785
SWITCHING
Q640, Q642 2SA1048
SWITCHING
【AM SWITCH BOARD】
S903
D606-D614 ISS202-1
D622
IC605
D801-D818
SEL1170K
STATION IND
D821-D827
ISS201-1
S801
S802
S803
S804
S805
S806
S807
S808
S809 TUNING -
S810 TUNING +
S811 TUNE MODE
S812 HI BLEND
S813 IF BAND
S814 FM AM
S815 CAL. TONE
S816 MUTING MODE
S817 SCAN READ
S818 MEMORY SET
【DISPLAY BOARD(2/2)】
【ACT BOARD】
OUTPUT (AUDIO/CURRENT) TRANSFER
L-CH
R-CH
Q501 2SA768
Q502 2SK246
Q503 2SA1048
REG
D509 HZ16-1
STABILIZER
D510 HZ6B1L
STABILIZER
D501-D504
10D-F2
RECT
D505-D508 10E-2
RECT
IC501
REG
CURREN REG
THERMAL-SHUT OFF
IC501
LA5658
REG
RESET
(US, Canadian, AEP, G-AEP, UK, E)
【POWER SWITCH BOARD】
【TUNER BOARD(1/3)】
AEP, UK, G-AEP MODEL
【POWER SWITCH BOARD】
【TUNER BOARD(1/3)】
【TUNER BOARD(1/3)】
US, Canadian MODEL
(AEP, G-AEP, UK, E)


IC102 μPC4558C
COMP AMP
IC201 μPC1223C-1
MPX DECODER
D106, D107
ISS202
D103, D104 ISS202
FM DETECTOR
Q201 2SK30
SWITCH
Q203 2SA1048
SWITCH
IC201
PRE AMP
PRE AMP
REG.
PHASE DET
DC AMP
LAMP DRIVE
DC AMP
AGC AMP
PHASE DET
COMPOSITE LEVEL
INVERTER AMP
CHOPPER
CHOPPER
CHOPPER
CHOPPER
AMP
AMP
76-38 DIVIDER
38-19 DIVIDER
38-19 DIVIDER
38kHz DRIVE
COMPOSITE MUTE
VCO 76kHz
VCO SWITCH
D201-D203
ISS202-1
PILOT CANCEL
IC202
TC4066BP
AF SWITCHING
Q207, Q257 2SK30
MUTING SWITCHING
IC203 μPC4558C
AUDIO AMP
IC204 NE5532P
V-I CONVERTER
TL082CP
Q208, Q258 2SK170
MUTING
Q643 2SA1048
SWITCHING
IC603 SN74LS145N
LAMP DRIVE
Q205
Q204
Q204, Q205
2SA1048
SWITCH
D620, D621 ISS202
Q637
2SC2785
SWITCH
Q638 2SA1048
SWITCHING
D615, D616
ISS202-1
Q639, Q641 2SC2785
SWITCHING
Q640, Q642 2SA1048
SWITCHING
D606-D614 ISS202-1
D622
IC605
D801-D818
SEL170K
STATION IND
D821-D827
ISS201-1
IC501
LA5658
REG
Q501 2SA768
Q502 2SK246
Q503 2SA1048
D509 HZ16-1
STABILIZER
D510 HZ6B1L
STABILIZER
D501-D504
10D-F2
RECT
D505-D508 10E-2
RECT
E MODEL
PT901
POWER TRANSFORMER
INTERNAL CONNECTION
SELECTOR POSITION
220V
240V
AC INPUT
120V/220V/240V~
50Hz/60Hz
* NOT REPLACEABLE:
BUILT IN TRANSFORMER
【POWER SWITCH BOARD】
【TUNER BOARD(1/3)】
【ACT BOARD】
OUTPUT (AUDIO CURRENT) TRANSFER
【PROGRAM BOARD】
【AM SWITCH BOARD】
【DISPLAY BOARD(2/2)】
AEP, UK, G-AEP MODEL
US, Canadian MODEL

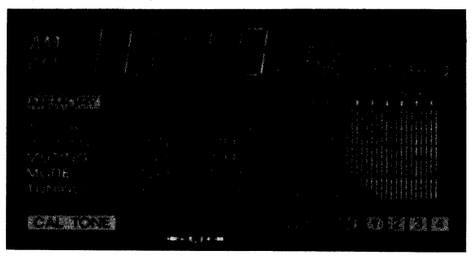
Note for schematic diagram:

- All capacitors are in μF unless otherwise noted. pF : μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in ohms, ¼W unless otherwise noted. kΩ : 1000Ω, MΩ : 1000kΩ
- ⊣W⊢ : nonflammable resistor.
- △ : internal component.
- ▭ : adjustment for repair.
- ——— : B+ bus.
- – – – : B- bus.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken under detuned conditions with a VOM
- Voltage variations may be noted due to normal production tolerances.
  no mark : FM/common
  ( ) : AM
  < > : MUTING OFF
  ≪ ≫ : MUTING ON
- Refer to pages 19 and 20 for waveforms/voltages at circled red numbers.
- Switch

Ref. No.	Switch	Position
S801	PRESET 1	OFF
S802	PRESET 2	OFF
S803	PRESET 3	OFF
S804	PRESET 4	OFF
S805	PRESET 5	OFF
S806	PRESET 6	OFF
S807	PRESET 7	OFF
S808	PRESET 8	OFF
S809	TUNING –	OFF
S810	TUNING +	OFF
S811	TUNE MODE	OFF
S812	HI-BLEND	OFF
S813	IF BAND	OFF
S814	FM/AM	OFF
S815	CAL TONE	OFF
S816	MUTING/MODE	OFF
S817	SCAN READ	OFF
S818	MEMORY SET	OFF
S901	POWER	OFF
S902	PROGRAM	OFF
S903	10k/9k	9k
S904	VOLTAGE SELECTOR	220V

- ➡ : signal path

- **Fluorescent tube indication**



- Voltage and waveform have benn measured under condition shown above.

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

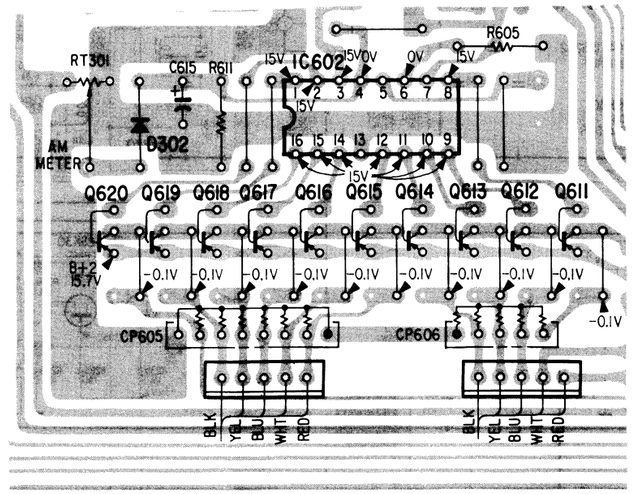
Note: Voltages are measured with a VOM (50kΩ/V).

1 2 3 4 5 6 7 8

A B C D E F G H I

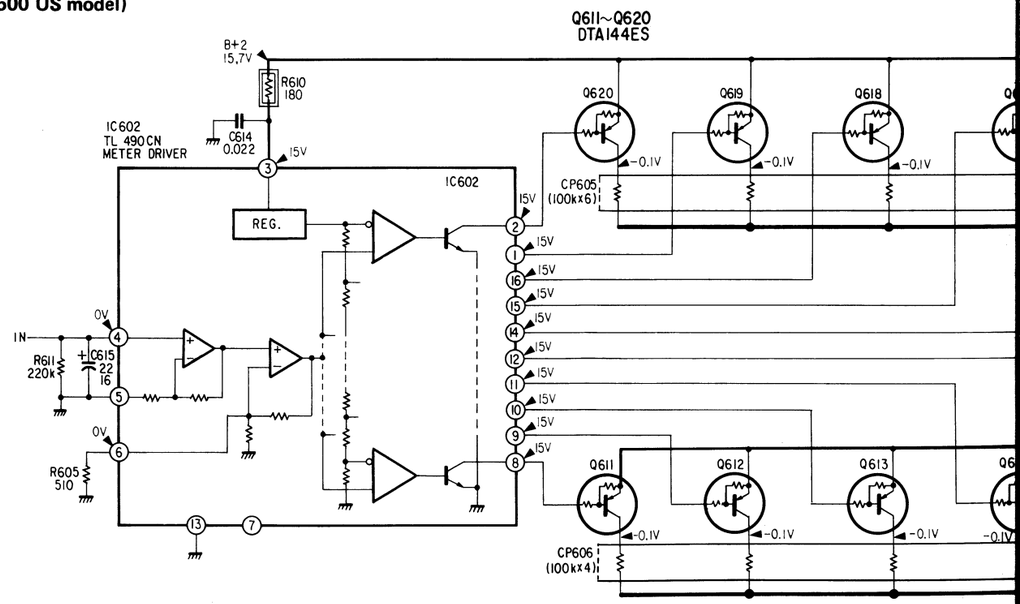
4-3. PART OF MOUNTING DIAGRAM

(Serial No. Up to 300200 E model)
(Serial No. Up to 500100 AEP model)
(Serial No. Up to 600100 UK model)
(Serial No. Up to 700300 Canadian model)
(Serial No. Up to 800500 US model)



4-4. PART OF SCHEMATIC DIAGRAM

(Serial No. Up to 300200 E model)
(Serial No. Up to 500100 AEP model)
(Serial No. Up to 600100 UK model)
(Serial No. Up to 700300 Canadian model)
(Serial No. Up to 800500 US model)



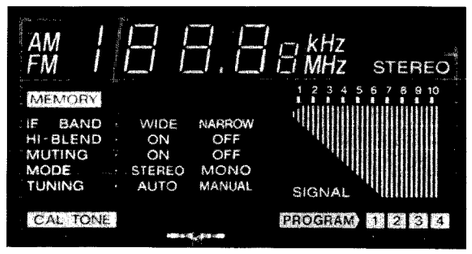
Note for schematic diagram:

- All capacitors are in μF unless otherwise noted. pF : μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in ohms, ¼W unless otherwise noted. kΩ : 1000Ω, MΩ : 1000kΩ
- : nonflammable resistor.
- △ : internal component.
- [illegible] for repair.
- [illegible] with respect to ground unless otherwise [illegible]
- [illegible] under detuned conditions with a VOM [illegible] may be noted due to normal produc[illegible]
- [illegible] voltages at circled [illegible]
- Switch

Ref. No.	Switch	Position
S801	PRESET 1	OFF
S802	PRESET 2	OFF
S803	PRESET 3	OFF
S804	PRESET 4	OFF
S805	PRESET 5	OFF
S806	PRESET 6	OFF
S807	PRESET 7	OFF
S808	PRESET 8	OFF
S809	TUNING –	OFF
S810	TUNING +	OFF
S811	TUNE MODE	OFF
S812	HI-BLEND	OFF
S813	IF BAND	OFF
S814	FM/AM	OFF
S815	CAL TONE	OFF
S816	MUTING/MODE	OFF
S817	SCAN READ	OFF
S818	MEMORY SET	OFF
S901	POWER	OFF
S902	PROGRAM	OFF
S903	10k/9k	9k
S904	VOLTAGE SELECTOR	220V

- : signal path

- **Fluorescent tube indication**



- Voltage and waveform have benn measured under condition shown above.

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

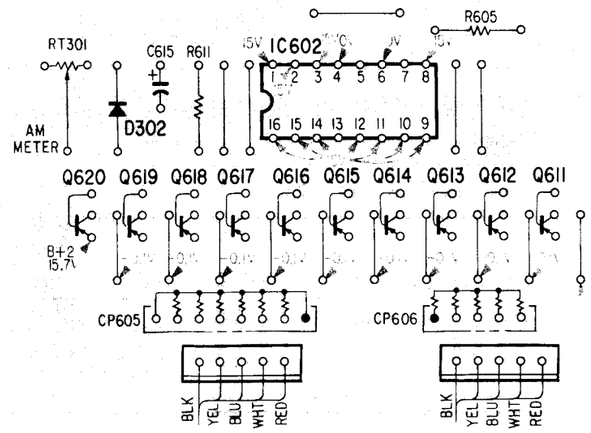
Note: Voltages are measured with a VOM (50kΩ/V).

1 2 3 4 5 6 7 8

A B C D E F G H I

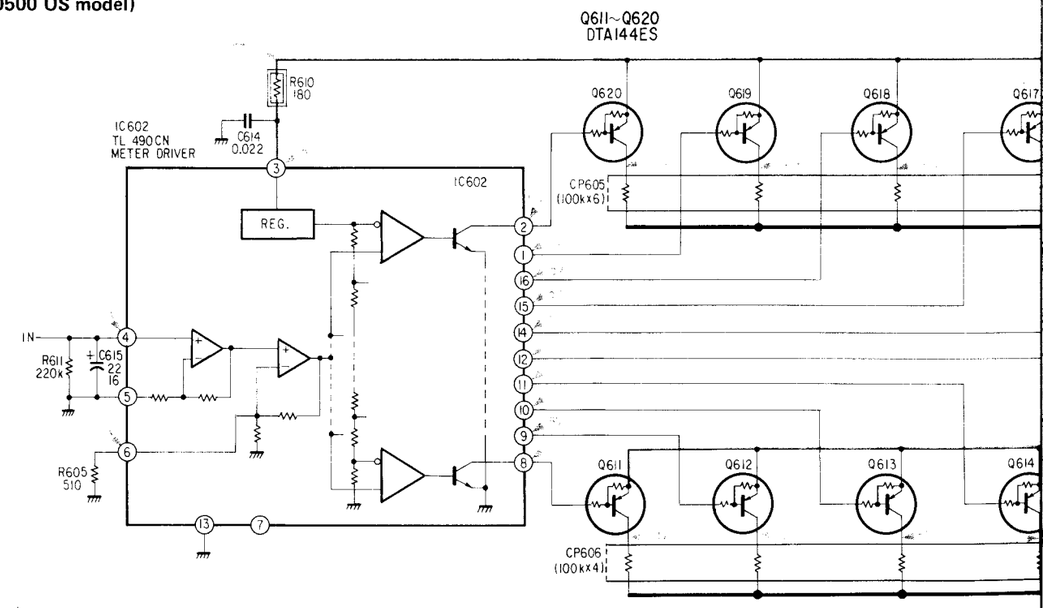
4-3. PART OF MOUNTING DIAGRAM

(Serial No. Up to 300200 E model)
(Serial No. Up to 500100 AEP model)
(Serial No. Up to 600100 UK model)
(Serial No. Up to 700300 Canadian model)
(Serial No. Up to 800500 US model)



4-4. PART OF SCHEMATIC DIAGRAM

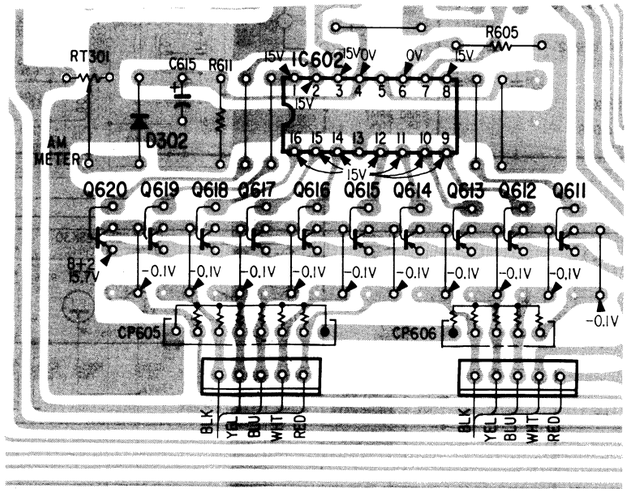
(Serial No. Up to 300200 E model)
(Serial No. Up to 500100 AEP model)
(Serial No. Up to 600100 UK model)
(Serial No. Up to 700300 Canadian model)
(Serial No. Up to 800500 US model)



SECTION 5
EXPLODED VIEWS AND PARTS LIST

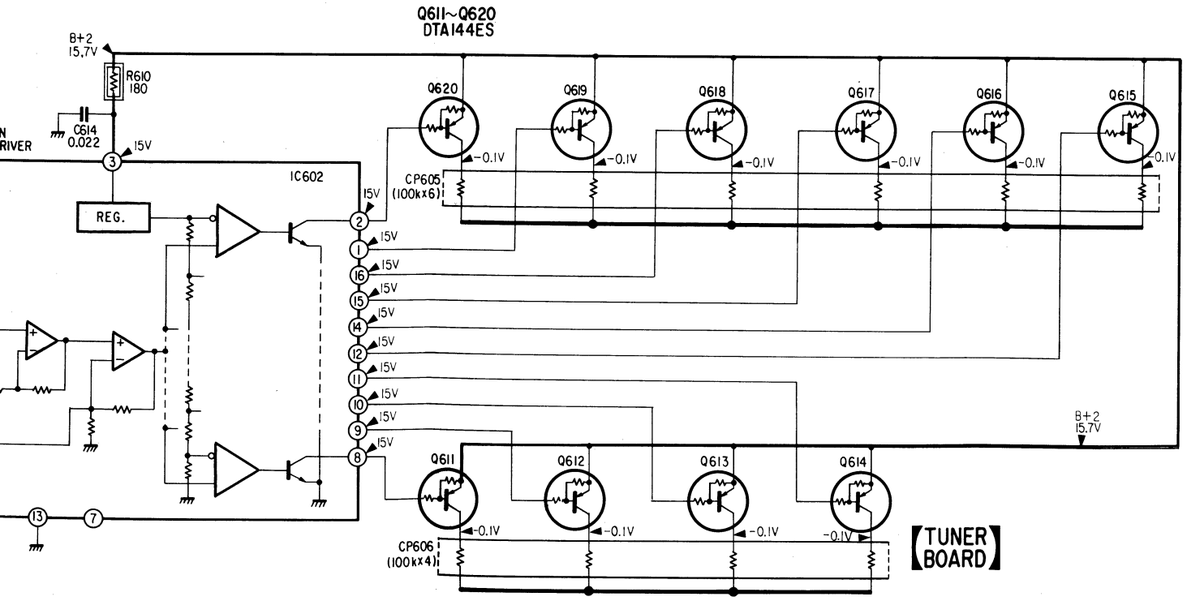
RAM

del)

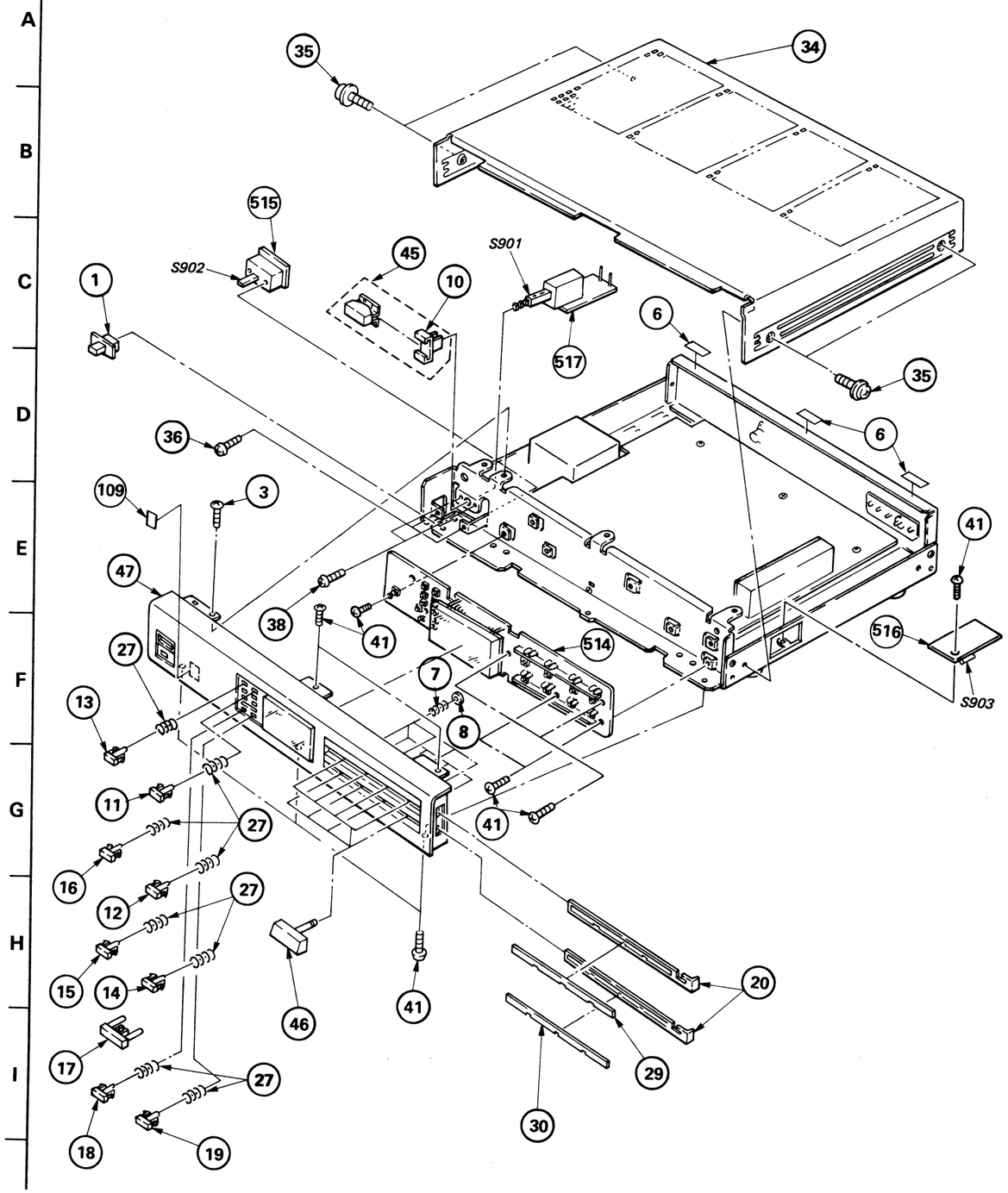


RAM

del)

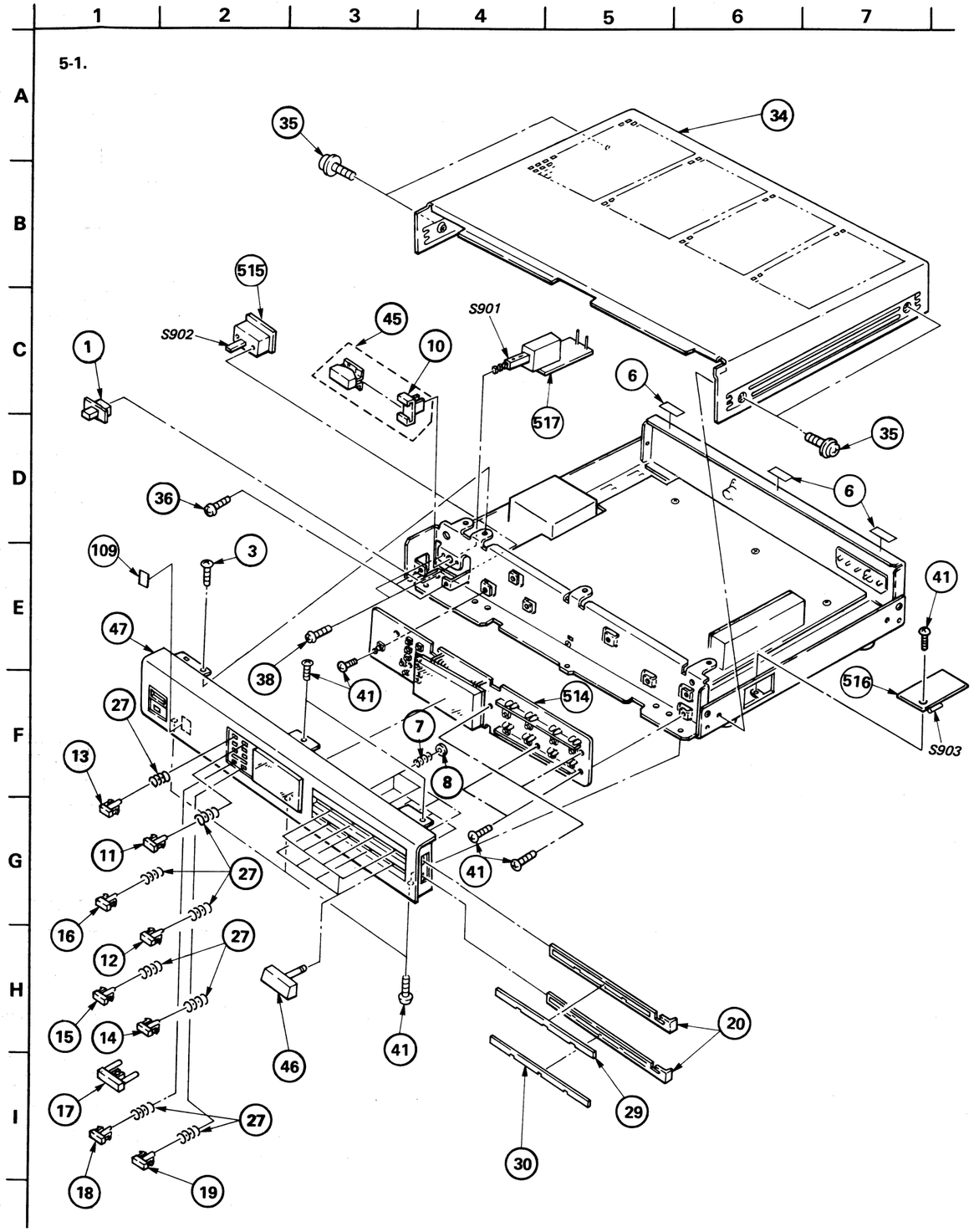


5-1.

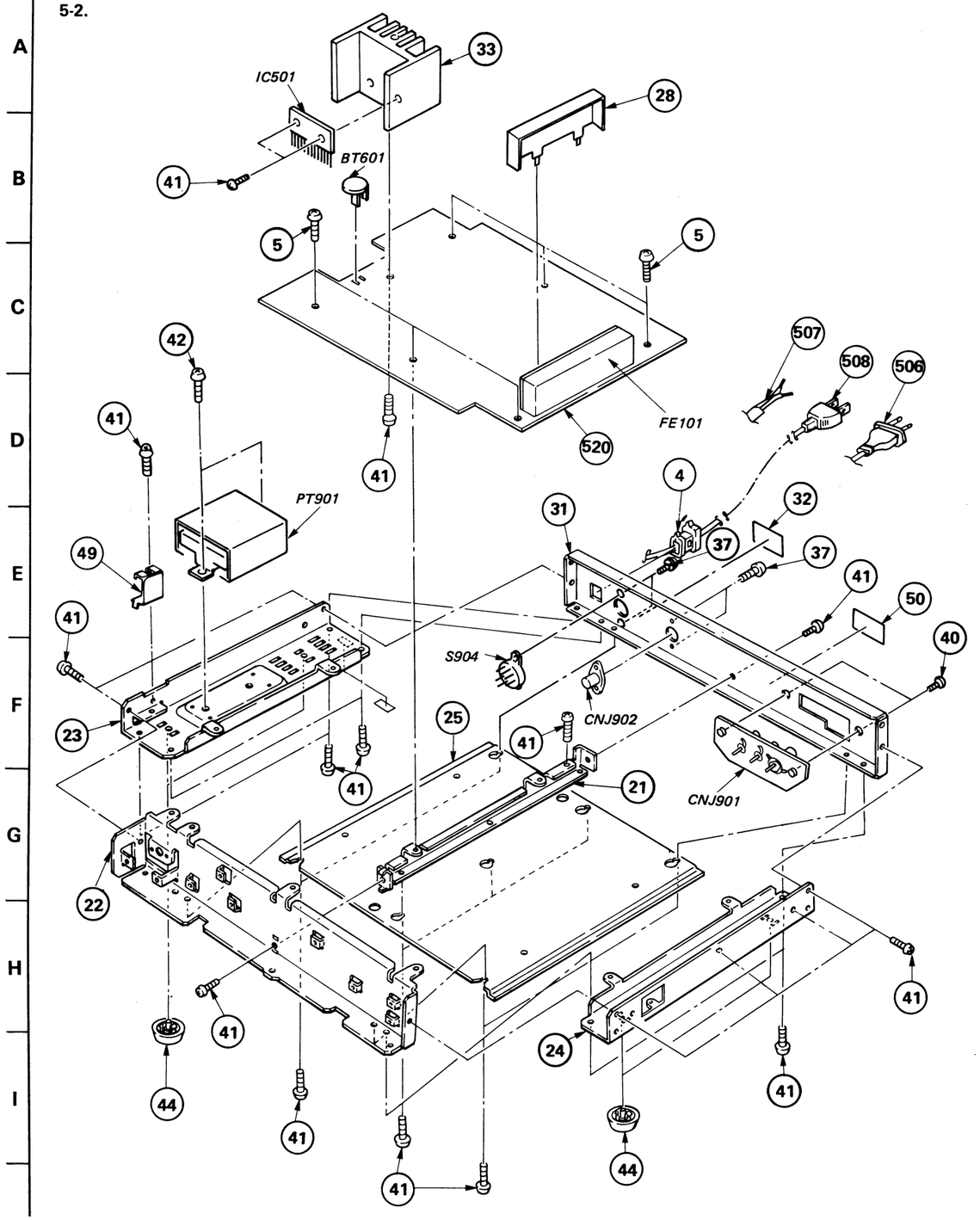


SECTION 5
EXPLODED VIEWS AND PARTS LIST

5-1.



5-2.



GENERAL SECTION

No.	Part No.	Description
1	3-575-515-21	KNOB, SLIDE SWITCH
2	3-701-748-00	CLAMP
3	3-703-108-21	SCREW +BV 3X6, S TIGHT
4	3-703-244-02	(AEP,G-AEP,UK)....BUSHING, CORD
4	3-703-571-00	(US,Canadian,E)...BUSHING (S), CORD
5	3-703-249-01	SCREW, S TIGHT, +PTTWH 3X6
6	3-831-441-XX	CUSHION, SPEAKER
7	4-854-743-00	SPRING, COMPRESSION
8	4-862-338-00	RING, STOPPER
9	.....	
10	4-866-342-00	JOINT (B), KNOB
11	4-886-002-21	KNOB (B), SQUARE
12	4-886-002-31	KNOB (B), SQUARE
13	4-886-002-61	KNOB (B), SQUARE
14	4-886-002-71	KNOB (B), SQUARE
15	4-886-002-81	KNOB (B), SQUARE
16	4-886-002-91	KNOB (B), SQUARE
17	4-886-003-00	KNOB, TUNING
18	4-886-004-02	KNOB (C), SQUARE
19	4-886-004-12	KNOB (C), SQUARE
20	4-886-014-00	HOLDER, INDICATOR
21	*4-886-015-00	REINFORCEMENT
22	*4-886-021-00	PANEL, SUB
23	*4-886-022-00	CHASSIS (LEFT)
24	*4-886-023-00	CHASSIS (RIGHT)
25	*4-886-025-00	PLATE, BOTTOM
26	4-886-031-00	CHIP, ADHESIVE
27	4-886-032-00	SPRING, COMPRESSION
28	4-886-050-00	(AEP,G-AEP,UK)...CASE, SHIELD
29	4-886-052-01	(UK).....LABEL, INDICATOR
29	4-886-056-01	(AEP,G-AEP).....LABEL, INDICATOR
29	4-886-058-01	(US,Canadian,E)...LABEL, INDICATOR
30	4-886-053-01	(UK).....LABEL, INDICATOR
30	4-886-057-01	(AEP,G-AEP).....LABEL, INDICATOR
30	4-886-059-01	(US,Canadian,E)...LABEL, INDICATOR
31	4-886-068-11	(E).....PLATE, JACK
31	4-886-068-21	(AEP,G-AEP,UK,US)...PLATE, JACK
32	*4-886-074-01	(US,Canadian)...LABEL, MODEL NUMBER
32	*4-886-076-01	(UK).....LABEL, MODEL NUMBER
32	*4-886-077-01	(AEP,G-AEP).....LABEL, MODEL NUMBER
33	*4-886-081-11	HEAT SINK
34	4-886-082-01	CASE
35	4-889-321-11	SCREW
36	7-621-775-10	SCREW +B 2.6X4
37	7-682-547-09	SCREW +B 3X6
38	7-682-647-01	SCREW +PS 3X6

GENERAL SECTION

No.	Part No.	Description
39	.....	
40	7-685-646-19	SCREW +BVTP 3X8 TYPE2 N-S
41	7-685-751-09	SCREW +BVTT 3X6 (S)
42	7-685-880-01	SCREW +BVTT 4X6 (S)
43	A-4332-727-A	(US,Canadian)...PLATE ASSY, JACK
44	X-4864-303-0	FOOT ASSY
45	X-4885-901-0	KNOB ASSY, POWER
46	X-4886-002-1	KNOB ASSY
47	X-4886-003-1	PANEL ASSY
48	3-703-590-00	(G-AEP).....LABEL, FTZ
49	*4-884-808-00	(AEP,G-AEP,UK,E)...PROTECTOR
50	*4-886-075-01	(E)...LABEL, MODEL NUMBER
51	7-685-870-01	SCREW +BVTT 3X5
52	4-875-354-01	(AEP,G-AEP,UK,E)...PLATE, INSLULATION

NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- If there are two or more same circuitsin a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:

- All capacitors are in µF. Common capacitors are omitted. Refer to the following lists for their part numbers. MF:µF, PF:µµF.

COILS

- MMH : mH, UH : µH

SEMICONDUCTORS

In each case, U : µ, for example:
UA···: µA···, UPA···: µPA···, UPC···: µPC, UPD···: µPD···

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

ACCESSORY & PACKING MATERIAL

No.	Part No.	Description
101	1-402-082-11	ANTENNA, FERRITE-ROD (LW/MW/SW)
102	1-417-090-00	(AEP,G-AEP,UK)...TRANSFORMER, ANTENNA MATCHING
103	1-501-224-00	ANTENNA, FEEDER
104	1-506-305-00	(US,Canadian,E)...PLUG, F (FP-33)
105	1-513-379-00	(US,Canadian,E)...CONVERTER (EAC-25)
106	3-701-630-00	BAG, POLYETHYLENE
107	3-703-390-01	(US).....INSTRUCTION
108	3-703-680-00	(US).....LABEL, CAUTION, SUB, NEW UL
109	3-703-710-41	STICKER, SONY SYMBOL (12)
110	3-773-853-11	MANUAL, INSTRUCTION
111	4-886-061-01	(UK).....LABEL, INDICATOR
111	4-886-062-01	(US,Canadian,E)...LABEL, INDICATOR
111	4-886-064-01	(AEP,G-AEP).....LABEL, INDICATOR
112	4-886-065-01	(AEP,G-AEP).....LABEL, INDICATOR
112	4-886-067-01	(US,Canadian,E)...LABEL, INDICATOR
113	A-4490-145-A	ACT ASSY
114 ⚠	1-526-565-00	(E)....ADAPTOR, AC PLUG
115	3-703-669-00	(G-AEP)...SHEET, CAUTION, FTZ
116	4-886-063-01	(E)....LABEL, INDICATOR
117	4-886-066-01	(E)....LABEL, INDICATOR
118	4-886-070-01	CARTON, INDIVIDUAL
119	4-886-069-01	HOLDER, ANTENNA
120	4-886-071-01	CUSHION, BOTTOM
121	4-886-072-01	CUSHION, TOP
122	4-858-078-01	SHEET, PROTECTION

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
501	*1-535-116-00	TERMINAL			
502	*1-535-119-00	TERMINAL			
503	*1-535-135-00	BASE POST 14MM (10MM PITCH)			
504	1-535-416-00	TERMINAL			
505	.....				
506 ⚠	1-555-795-00	(AEP,G-AEP).....CORD, POWER			
507 ⚠	1-556-035-00	(UK).....CORD, POWER			
508 ⚠	1-556-874-00	(US,Canadian,E)...CORD, POWER			
509	*1-560-060-00	PIN, CONNECTOR 2P			
510	*1-560-063-00	PIN, CONNECTOR 5P			
511	*1-560-063-00	PIN, CONNECTOR 5P			
512	*1-560-242-61	BUS BAR 2P			
513	*1-612-846-11	PC BOARD, TUNER			
514	*1-612-847-11	PC BOARD, DISPLAY			
515	*1-612-848-11	PC BOARD, PROGRAM SW			
516	*1-612-849-11	(US,Canadian,E)...PC BOARD, AM SW			
517	*1-612-851-11	PC BOARD, AC SW			
518	*1-612-852-11	PC BOARD, ACT			
519	*A-4335-315-A	PC BOARD ASSY, TUNER			
520	A-4351-400-A	(US,Canadian,E)...MOUNTED PCB, TUNER			
520	A-4351-401-A	(AEP,G-AEP,UK)....MOUNTED PCB, TUNER			
BT601	1-528-120-00	BATTERY, LITHIUM (CR-2025)			
C101	1-161-494-00	CERAMIC	0.022MF	30%	25V
C102	1-123-333-00	ELECT	100MF	20%	16V
C103	1-161-494-00	CERAMIC	0.022MF	30%	25V
C104	1-161-494-00	CERAMIC	0.022MF	30%	25V
C105	1-161-494-00	CERAMIC	0.022MF	30%	25V
C106	1-161-494-00	CERAMIC	0.022MF	30%	25V
C107	1-161-494-00	CERAMIC	0.022MF	30%	25V
C108	1-161-494-00	CERAMIC	0.022MF	30%	25V
C109	1-161-494-00	CERAMIC	0.022MF	30%	25V
C110	1-161-323-00	CERAMIC	0.001MF	10%	50V
C111	1-161-494-00	CERAMIC	0.022MF	30%	25V
C112	1-161-494-00	CERAMIC	0.022MF	30%	25V
C113	1-161-494-00	CERAMIC	0.022MF	30%	25V
C114	1-161-494-00	CERAMIC	0.022MF	30%	25V
C115	1-161-323-00	CERAMIC	0.001MF	10%	50V
C116	1-161-494-00	CERAMIC	0.022MF	30%	25V
C117	1-161-494-00	CERAMIC	0.022MF	30%	25V
C118	1-161-494-00	CERAMIC	0.022MF	30%	25V
C119	1-161-494-00	CERAMIC	0.022MF	30%	25V
C120	1-123-381-00	ELECT	2.2MF	20%	50V
C121	1-161-494-00	CERAMIC	0.022MF	30%	25V
C122	1-123-607-00	ELECT	0.1MF	20%	50V
C123	1-161-494-00	CERAMIC	0.022MF	30%	25V
C124	1-161-494-00	CERAMIC	0.022MF	30%	25V

NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- If there are two or more same circuitsin a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:

- All capacitors are in µF. Common capacitors are omitted. Refer to the following lists for their part numbers. MF:µF, PF:µµF.

COILS

- MMH : mH, UH : µH

SEMICONDUCTORS

In each case, U : µ, for example:
UA···: µA···, UPA···: µPA···, UPC···: µPC, UPD···: µPD···

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
C125	1-123-321-00	ELECT	220MF	20%	16V
C126	1-161-494-00	CERAMIC	0.022MF	30%	25V
C127	1-161-279-00	CERAMIC	10PF	5%	50V
C128	1-161-494-00	CERAMIC	0.022MF	30%	25V
C129	1-161-323-00	CERAMIC	0.001MF	10%	50V
C130	1-161-494-00	CERAMIC	0.022MF	30%	25V
C131	1-123-356-00	ELECT	10MF	20%	16V
C132	1-161-494-00	CERAMIC	0.022MF	30%	25V
C133	1-107-310-00	MICA	220PF	5%	500V
C134	1-107-310-00	MICA	220PF	5%	500V
C135	1-123-356-00	ELECT	10MF	20%	16V
C136	1-107-317-00	MICA	33PF	5%	500V
C137	1-123-321-00	ELECT	220MF	20%	16V
C138	1-123-321-00	ELECT	220MF	20%	16V
C139	1-161-271-00	CERAMIC	100PF	5%	50V
C140	1-161-271-00	CERAMIC	100PF	5%	50V
C141	1-161-494-00	CERAMIC	0.022MF	30%	25V
C142	1-161-494-00	CERAMIC	0.022MF	30%	25V
C143	1-161-494-00	CERAMIC	0.022MF	30%	25V
C144	1-123-333-00	ELECT	100MF	20%	16V
C145	1-161-494-00	CERAMIC	0.022MF	30%	25V
C146	1-161-494-00	CERAMIC	0.022MF	30%	25V
C151	1-161-279-00	CERAMIC	10PF	5%	50V
C152	1-161-494-00	CERAMIC	0.022MF	30%	25V
C153	1-161-494-00	CERAMIC	0.022MF	30%	25V
C154	1-161-494-00	CERAMIC	0.022MF	30%	25V
C155	1-161-494-00	CERAMIC	0.022MF	30%	25V
C173	1-123-379-00	ELECT	0.47MF	20%	50V
C201	1-123-307-00	ELECT	100MF	20%	10V
C202	1-123-668-00	ELECT	22MF	20%	10V
C203	1-123-323-00	ELECT	470MF	20%	16V
C204	1-103-749-00	POLYSTYRENE	0.01MF	5%	50V
C205	1-123-323-00	ELECT	470MF	20%	16V
C206	1-108-571-00	MYLAR	0.0047MF	5%	50V
C207	1-108-595-00	MYLAR	0.047MF	5%	50V
C208	1-104-067-00	POLYSTYRENE	390PF	5%	50V
C209	1-108-565-00	MYLAR	0.0027MF	5%	50V
C210	1-123-610-00	ELECT	0.47MF	20%	50V
C211	1-123-616-00	ELECT	4.7MF	20%	25V
C212	1-161-322-00	CERAMIC	820PF	10%	50V
C213	1-123-617-00	ELECT	10MF	20%	16V
C214	1-161-494-00	CERAMIC	0.022MF	30%	25V
C215	1-123-617-00	ELECT	10MF	20%	16V
C216	1-108-587-00	MYLAR	0.022MF	5%	50V
C217	1-123-306-00	ELECT	47MF	20%	10V
C218	1-123-306-00	ELECT	47MF	20%	10V

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
C219	1-123-334-00	ELECT	220MF	20%	25V
C220	1-123-334-00	ELECT	220MF	20%	25V
C221	1-123-336-00	ELECT	470MF	20%	25V
C222	1-123-336-00	ELECT	470MF	20%	25V
C230	1-104-228-00	(AEP,G-AEP,UK,E)...POLYSTYRENE 0.0015MF		5%	125V
C230	1-104-237-00	(US,Canadian).....POLYSTYRENE 0.0024MF		5%	125V
C231	1-123-678-00	ELECT	10MF	20%	16V
C232	1-107-037-00	MICA	82PF	5%	500V
C280	1-104-228-00	(AEP,G-AEP,UK)...POLYSTYRENE 0.0015MF		5%	125V
C280	1-104-237-00	(US,Canadian)....POLYSTYRENE 0.0024MF		5%	125V
C281	1-123-678-00	ELECT	10MF	20%	16V
C282	1-107-037-00	MICA	82PF	5%	500V
C301	1-101-005-00	CERAMIC	0.022MF		50V
C302	1-161-253-00	CERAMIC	3.3PF	10%	50V
C303	1-161-494-00	CERAMIC	0.022MF	30%	25V
C304	1-161-494-00	CERAMIC	0.022MF	30%	25V
C305	1-161-494-00	CERAMIC	0.022MF	30%	25V
C306	1-161-494-00	CERAMIC	0.022MF	30%	25V
C307	1-123-332-00	ELECT	47MF	20%	16V
C308	1-161-494-00	CERAMIC	0.022MF	30%	25V
C309	1-161-267-00	CERAMIC	47PF	5%	50V
C310	1-161-494-00	CERAMIC	0.022MF	30%	25V
C311	1-161-259-00	CERAMIC	10PF	5%	50V
C312	1-104-070-00	POLYSTYRENE	510PF	5%	50V
C313	1-123-380-00	ELECT	1MF	20%	50V
C314	1-161-494-00	CERAMIC	0.022MF	30%	25V
C315	1-123-369-00	ELECT	4.7MF	20%	50V
C316	1-123-379-00	ELECT	0.47MF	20%	50V
C317	1-161-494-00	CERAMIC	0.022MF	30%	25V
C318	1-123-320-00	ELECT	100MF	20%	16V
C319	1-161-323-00	CERAMIC	0.001MF	10%	50V
C320	1-123-382-00	ELECT	3.3MF	20%	50V
C321	1-108-591-00	MYLAR	0.033MF	5%	50V
C322	1-108-563-00	MYLAR	0.0022MF	5%	50V
C323	1-108-587-00	MYLAR	0.022MF	5%	50V
C324	1-161-271-00	CERAMIC	100PF	5%	50V
C325	1-123-381-00	ELECT	2.2MF	20%	50V
C501	1-123-348-00	ELECT	470MF	20%	35V
C502	1-123-320-00	ELECT	100MF	20%	16V
C503	1-123-324-00	ELECT	1000MF	20%	16V
C504	1-161-494-00	CERAMIC	0.022MF	30%	25V
C505	1-123-362-00	ELECT	330MF	20%	50V
C506	1-123-323-00	ELECT	470MF	20%	16V

NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- If there are two or more same circuitsin a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:

- All capacitors are in μF. Common capacitors are omitted. Refer to the following lists for their part numbers. MF:μF, PF:μμF.

COILS

- MMH : mH, UH : μH

SEMICONDUCTORS

In each case, U : μ, for example:
UA···: μA···, UPA···: μPA···, UPC···: μPC, UPD···: μPD···

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

ELECTRICAL PARTS

Ref.No.	Part No.	Description
C507	1-123-350-00	ELECT 2200MF 20% 35V
C509	1-123-324-00	ELECT 1000MF 20% 16V
C510	1-123-330-00	(AEP,Canadian,UK,US,E)...ELECT 22MF 20% 16V
C511	1-123-306-00	ELECT 47MF 20% 6.3V
C601	1-131-344-71	TANTALUM 0.33MF 20% 35V
C602	1-131-350-71	TANTALUM 3.3MF 20% 35V
C603	1-123-356-00	ELECT 10MF 20% 35V
C604	1-101-005-00	CERAMIC 0.022MF 50V
C605	1-101-005-00	CERAMIC 0.022MF 50V
C606	1-161-494-00	CERAMIC 0.022MF 30% 25V
C607	1-161-494-00	CERAMIC 0.022MF 30% 25V
C608	1-161-267-00	CERAMIC 47PF 5% 50V
C609	1-161-330-00	CERAMIC 0.01MF 30% 25V
C610	1-102-526-00	CERAMIC 75PF 5% 50V
C611	1-102-852-00	CERAMIC 47PF 5% 50V
C612	1-123-306-00	ELECT 47MF 20% 6.3V
C613	1-161-494-00	CERAMIC 0.022MF 30% 25V
C614	1-161-494-00	CERAMIC 0.022MF 30% 25V
C615	1-123-330-00	(AEP,Canadian,UK,US,E)...ELECT 22MF 20% 16V
C616	1-123-380-00	ELECT 1MF 20% 50V
C617	1-102-529-00	CERAMIC 100PF 5% 50V
C618	1-102-529-00	CERAMIC 100PF 5% 50V
C619	1-161-494-00	CERAMIC 0.022MF 30% 25V
C620	1-108-595-00	MYLAR 0.047MF 5% 50V
C621	1-123-382-00	ELECT 3.3MF 20% 50V
C622	1-123-307-00	ELECT 100MF 20% 6.3V
C623	1-123-307-00	ELECT 100MF 20% 6.3V
C624	1-123-332-00	ELECT 47MF 20% 16V
C625	1-123-306-00	ELECT 47MF 20% 6.3V
C626	1-161-494-00	CERAMIC 0.022MF 30% 25V
C627	1-123-306-00	ELECT 47MF 20% 10V
C628	1-123-356-00	ELECT 10MF 20% 16V
C629	1-123-306-00	ELECT 47MF 20% 6.3V
C630	1-123-359-00	ELECT 47MF 20% 35V
C801	1-161-323-00	CERAMIC 0.001MF 10% 50V
C802	1-161-323-00	CERAMIC 0.001MF 10% 50V
C803	1-161-323-00	CERAMIC 0.001MF 10% 50V
C901 ⚠	1-161-744-00	CERAMIC 0.01MF 400V
C902	1-123-551-00	ELECT 10MF 20% 50V
C952	1-123-551-00	ELECT 10MF 20% 50V
CF101	1-527-796-00	(AEP,UK,US,E,Canadian).. FILTER, CERAMIC
CF101	1-527-799-00	(G-AEP)..... FILTER, CERAMIC
CF102	1-527-796-00	(AEP,UK,US,E,Canadian).. FILTER, CERAMIC
CF102	1-527-799-00	(G-AEP)..... FILTER, CERAMIC
CF103	1-527-796-00	FILTER, CERAMIC
CF104	1-527-796-00	FILTER, CERAMIC

ELECTRICAL PARTS

Ref.No.	Part No.	Description
CF301	1-527-937-00	FILTER, CERAMIC
CF302	1-527-981-00	FILTER, CERAMIC
CF601	1-527-822-00	OSCILLATOR, CERAMIC
CNJ901	1-536-634-00	(US,Canadian,E)..TERMINAL BOARD(ANTENNA)
CNJ901	1-536-851-00	(AEP,G-AEP,UK)...TERMINAL BOARD(ANT)
CNJ902	1-561-598-21	SOCKET 4P (OUTPUT)
CP501	1-102-394-00	CERAMIC 250V
CP502	1-102-394-00	CERAMIC 250V
CP503	1-102-394-00	CERAMIC 250V
CP504	1-102-394-00	CERAMIC 250V
CP606	1-231-619-00	COMPOSITION CIRCUIT BLOCK
CT301	1-141-180-00	CAP,TRIMMER 15P
CT302	1-141-171-00	CAP,TRIMMER 20P
D101	8-719-107-94	DIODE 1SS202-1
D102	8-719-107-94	DIODE 1SS202-1
D103	8-719-107-94	DIODE 1SS202-1
D104	8-719-107-94	DIODE 1SS202-1
D106	8-719-026-11	DIODE 1T261
D107	8-719-026-11	DIODE 1T261
D151	8-719-901-43	DIODE HZ4B3
D152	8-719-107-94	DIODE 1SS202-1
D201	8-719-107-94	DIODE 1SS202-1
D202	8-719-107-94	DIODE 1SS202-1
D203	8-719-107-94	DIODE 1SS202-1
D301	8-719-912-27	DIODE KV1226
D302	8-719-107-94	DIODE 1SS202-1
D501	8-719-210-12	DIODE 10DF2
D502	8-719-210-12	DIODE 10DF2
D503	8-719-210-12	DIODE 10DF2
D504	8-719-210-12	DIODE 10DF2
D505	8-719-200-02	DIODE 10E-2
D506	8-719-200-02	DIODE 10E-2
D507	8-719-200-02	DIODE 10E-2
D508	8-719-200-02	DIODE 10E-2
D509	8-719-901-62	DIODE HZ16-2L
D510	8-719-910-61	DIODE HZ6B1L
D601	8-719-107-94	DIODE 1SS202-1
D602	8-719-107-94	DIODE 1SS202-1
D603	8-719-107-94	DIODE 1SS202-1
D604	8-719-107-94	DIODE 1SS202-1
D605	8-719-107-94	DIODE 1SS202-1
D606	8-719-107-94	DIODE 1SS202-1
D607	8-719-107-94	(AEP,G-AEP,UK,E)...DIODE 1SS202-1
D608	8-719-107-94	(US,Canadian).....DIODE 1SS202-1

NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked " ★ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- If there are two or more same circuitsin a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:

- All capacitors are in μF. Common capacitors are omitted. Refer to the following lists for their part numbers. MF:μF, PF:μμF.

COILS

- MMH : mH, UH : μH

SEMICONDUCTORS

In each case, U : μ, for example:
UA···: μA···, UPA···: μPA···, UPC···: μPC, UPD···: μPD···

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

ELECTRICAL PARTS

Ref.No.	Part No.	Description
D609	8-719-107-94	DIODE 1SS202-1
D610	8-719-107-94	DIODE 1SS202-1
D611	8-719-107-94	DIODE 1SS202-1
D612	8-719-107-94	DIODE 1SS202-1
D613	8-719-107-94	DIODE 1SS202-1
D614	8-719-107-94	DIODE 1SS202-1
D615	8-719-107-94	DIODE 1SS202-1
D616	8-719-107-94	DIODE 1SS202-1
D620	8-719-107-94	DIODE 1SS202-1
D621	8-719-107-94	DIODE 1SS202-1
D622	8-719-107-94	DIODE 1SS202-1
D801	8-719-317-10	DIODE SEL1710K
D802	8-719-317-10	DIODE SEL1710K
D803	8-719-317-10	DIODE SEL1710K
D804	8-719-317-10	DIODE SEL1710K
D805	8-719-317-10	DIODE SEL1710K
D806	8-719-317-10	DIODE SEL1710K
D807	8-719-317-10	DIODE SEL1710K
D808	8-719-317-10	DIODE SEL1710K
D811	8-719-317-10	DIODE SEL1710K
D812	8-719-317-10	DIODE SEL1710K
D813	8-719-317-10	DIODE SEL1710K
D814	8-719-317-10	DIODE SEL1710K
D815	8-719-317-10	DIODE SEL1710K
D816	8-719-317-10	DIODE SEL1710K
D817	8-719-317-10	DIODE SEL1710K
D818	8-719-317-10	DIODE SEL1710K
D821	8-719-107-94	DIODE 1SS202-1
D822	8-719-107-94	DIODE 1SS202-1
D823	8-719-107-94	DIODE 1SS202-1
D824	8-719-107-94	DIODE 1SS202-1
D825	8-719-107-94	DIODE 1SS202-1
D826	8-719-107-94	DIODE 1SS202-1
D827	8-719-107-94	DIODE 1SS202-1
FE101	A-4344-044-A	FRONT END, FM (FEE-5112)
FL801	1-519-321-11	INDICATOR TUBE, FLUORESCENT
IC101	8-759-812-35	IC LA1235
IC102	8-759-145-58	IC UPC4558C
IC103	8-759-111-63	IC UPC1163H
IC151	8-759-812-35	IC LA1235
IC201	8-759-102-27	IC UPC1223C-1
IC202	8-759-240-66	IC TC4066BP
IC203	8-759-145-58	IC UPC4558C
IC204	8-759-900-72	(US,Canadian,AEP,UK)...IC NE5532P
IC204	8-759-990-82	(G-AEP).....IC TL082CP

ELECTRICAL PARTS

Ref.No.	Part No.	Description
IC301	8-759-812-45	IC LA1245
IC501	8-759-800-89	IC LA5658
IC601	8-759-925-00	IC CX-7925
IC602	8-759-906-38	IC TL490CN (Serial No. Up to 300200 E model) (Serial No. Up to 500100 AEP model) (Serial No. Up to 600100 UK model) (Serial No. Up to 700300 Canadian model) (Serial No. Up to 800500 US model)
IC602	8-759-801-57	IC LB1494
IC603	8-759-901-45	IC SN74LS145N
IC604	8-759-645-19	IC M54519P
IC605	8-759-202-03	IC TMP47C40N-6308
IC801	8-759-263-01	IC TD6301P
IC802	8-759-202-07	IC TC9174P
IFT101	1-404-312-00	TRANSFORMER, IF
IFT102	1-404-485-00	COIL, DISCRIMINATOR (PRIMARY)
IFT103	1-404-486-00	COIL, DISCRIMINATOR (SECONDARY)
IFT301	1-404-413-00	TRANSFORMER, IF
L101	1-408-575-00	MICRO INDUCTOR 100UH
L102	1-408-575-00	MICRO INDUCTOR 100UH
L103	1-408-575-00	MICRO INDUCTOR 100UH
L104	1-408-571-00	MICRO INDUCTOR 47UH
L201	1-426-092-00	COIL, (ALIGNMENT)
L301	1-402-080-11	COIL, ANT (MW)
L302	1-405-927-00	COIL, MW OSC
L601	1-408-575-00	MICRO INDUCTOR 100UH
L602	1-408-575-00	(SERIAL NO. 1801 AND LATER)...MICRO INDUCTOR 100UH
LPF101	1-235-266-00	FILTER, LOW PASS
LPF201	1-235-060-00	FILTER, LOW PASS
LPF251	1-235-060-00	FILTER, LOW PASS
⚠PT901	.1-447-843-11	(AEP,G-AEP,UK)...TRANSFORMER, POWER
⚠PT901	.1-447-862-11	(E).....TRANSFORMER, POWER
⚠PT901	.1-447-863-11	(US,Canadian)....TRANSFORMER, POWER
Q101	8-729-671-13	TRANSISTOR 2SC710-13
Q102	8-729-671-13	TRANSISTOR 2SC710-13
Q103	8-729-671-13	TRANSISTOR 2SC710-13
Q104	8-729-671-13	TRANSISTOR 2SC710-13
Q105	8-729-671-13	TRANSISTOR 2SC710-13
Q106	8-729-671-13	TRANSISTOR 2SC710-13
Q107	8-729-245-83	TRANSISTOR 2SC2458
Q108	8-729-245-83	TRANSISTOR 2SC2458
Q109	8-729-245-83	TRANSISTOR 2SC2458
Q110	8-729-245-83	TRANSISTOR 2SC2458
Q111	8-729-245-83	TRANSISTOR 2SC2458
Q112	8-729-671-13	TRANSISTOR 2SC710-13

NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked " ★ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- If there are two or more same circuitsin a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:

- All capacitors are in μF. Common capacitors are omitted. Refer to the following lists for their part numbers. MF:μF, PF:μμF.

COILS

- MMH : mH, UH : μH

SEMICONDUCTORS

In each case, U : μ, for example:
UA···: μA···, UPA···: μPA···, UPC···: μPC, UPD···: μPD···

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

ELECTRICAL PARTS

Ref.No.	Part No.	Description
Q151	8-729-606-33	TRANSISTOR 2SC2603
Q201	8-729-203-04	TRANSISTOR 2SK30A
Q202	8-729-245-83	TRANSISTOR 2SC2458
Q203	8-729-117-54	TRANSISTOR 2SA1175
Q204	8-729-117-54	TRANSISTOR 2SA1175
Q205	8-729-117-54	TRANSISTOR 2SA1175
Q206	8-729-117-54	TRANSISTOR 2SA1175
Q207	8-729-203-04	TRANSISTOR 2SK30A
Q208	8-729-217-03	TRANSISTOR 2SK170
Q257	8-729-203-04	TRANSISTOR 2SK30A
Q258	8-729-217-03	TRANSISTOR 2SK170
Q301	8-729-245-83	TRANSISTOR 2SC2458
Q302	8-729-245-83	TRANSISTOR 2SC2458
Q303	8-729-117-54	TRANSISTOR 2SA1175
Q304	8-729-245-83	TRANSISTOR 2SC2458
Q305	8-729-245-83	TRANSISTOR 2SC2458
Q306	8-729-245-83	TRANSISTOR 2SC2458
Q501	8-729-377-12	TRANSISTOR 2SA771
Q502	8-729-224-61	TRANSISTOR 2SK246-Y
Q503	8-729-117-54	TRANSISTOR 2SA1175
Q601	8-729-203-05	TRANSISTOR 2SK30A-GR3
Q602	8-729-664-48	TRANSISTOR 2SC1362-48
Q604	8-729-203-04	TRANSISTOR 2SK30A
Q605	8-729-245-83	TRANSISTOR 2SC2458
Q606	8-729-245-83	TRANSISTOR 2SC2458
Q607	8-729-245-83	TRANSISTOR 2SC2458
Q608	8-729-245-83	TRANSISTOR 2SC2458
Q609	8-729-900-36	TRANSISTOR DTC124ES
Q610	8-729-245-83	TRANSISTOR 2SC2458
Q611	8-729-900-65	TRANSISTOR DTA144ES (Serial No.Up to 300200 E model) (Serial No.Up to 500100 AEP model) (Serial No.Up to 600100 UK model) (Serial No.Up to 700300 Canadian model) (Serial No.Up to 800500 US model)
Q612	8-729-900-65	TRANSISTOR DTA144ES (Serial No.Up to 300200 E model) (Serial No.Up to 500100 AEP model) (Serial No.Up to 600100 UK model) (Serial No.Up to 700300 Canadian model) (Serial No.Up to 800500 US model)
Q613	8-729-900-65	TRANSISTOR DTA144ES (Serial No.Up to 300200 E model) (Serial No.Up to 500100 AEP model) (Serial No.Up to 600100 UK model) (Serial No.Up to 700300 Canadian model) (Serial No.Up to 800500 US model)

ELECTRICAL PARTS

Ref.No.	Part No.	Description
Q614	8-729-900-65	TRANSISTOR DTA144ES (Serial No.Up to 300200 E model) (Serial No.Up to 500100 AEP model) (Serial No.Up to 600100 UK model) (Serial No.Up to 700300 Canadian model) (Serial No.Up to 800500 US model)
Q615	8-729-900-65	TRANSISTOR DTA144ES (Serial No.Up to 300200 E model) (Serial No.Up to 500100 AEP model) (Serial No.Up to 600100 UK model) (Serial No.Up to 700300 Canadian model) (Serial No.Up to 800500 US model)
Q616	8-729-900-65	TRANSISTOR DTA144ES (Serial No.Up to 300200 E model) (Serial No.Up to 500100 AEP model) (Serial No.Up to 600100 UK model) (Serial No.Up to 700300 Canadian model) (Serial No.Up to 800500 US model)
Q617	8-729-900-65	TRANSISTOR DTA144ES (Serial No.Up to 300200 E model) (Serial No.Up to 500100 AEP model) (Serial No.Up to 600100 UK model) (Serial No.Up to 700300 Canadian model) (Serial No.Up to 800500 US model)
Q618	8-729-900-65	TRANSISTOR DTA144ES (Serial No.Up to 300200 E model) (Serial No.Up to 500100 AEP model) (Serial No.Up to 600100 UK model) (Serial No.Up to 700300 Canadian model) (Serial No.Up to 800500 US model)
Q619	8-729-900-65	TRANSISTOR DTA144ES (Serial No.Up to 300200 E model) (Serial No.Up to 500100 AEP model) (Serial No.Up to 600100 UK model) (Serial No.Up to 700300 Canadian model) (Serial No.Up to 800500 US model)
Q620	8-729-900-65	TRANSISTOR DTA144ES (Serial No.Up to 300200 E model) (Serial No.Up to 500100 AEP model) (Serial No.Up to 600100 UK model) (Serial No.Up to 700300 Canadian model) (Serial No.Up to 800500 US model)
Q621	8-729-117-54	TRANSISTOR 2SA1175
Q622	8-729-245-83	TRANSISTOR 2SC2458
Q623	8-729-900-69	TRANSISTOR DTA144WS
Q624	8-729-245-83	TRANSISTOR 2SC2458
Q625	8-729-900-69	TRANSISTOR DTA144WS
Q626	8-729-245-83	TRANSISTOR 2SC2458
Q627	8-729-900-69	TRANSISTOR DTA144WS
Q628	8-729-117-54	TRANSISTOR 2SA1175
Q629	8-729-900-69	TRANSISTOR DTA144WS
Q630	8-729-117-54	TRANSISTOR 2SA1175

NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- If there are two or more same circuitsin a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:

- All capacitors are in μF. Common capacitors are omitted. Refer to the following lists for their part numbers. MF:μF, PF:μμF.

COILS

- MMH : mH, UH : μH

SEMICONDUCTORS

In each case, U : μ, for example:
UA···: μA···, UPA···: μPA···, UPC···: μPC, UPD···: μPD···

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

ELECTRICAL PARTS

Ref.No.	Part No.	Description				
Q631	8-729-117-54	TRANSISTOR 2SA1175				
Q632	8-729-245-83	TRANSISTOR 2SC2458				
Q633	8-729-900-69	TRANSISTOR DTA144WS				
Q634	8-729-117-54	TRANSISTOR 2SA1175				
Q635	8-729-900-69	TRANSISTOR DTA144WS				
Q636	8-729-245-83	TRANSISTOR 2SC2458				
Q637	8-729-245-83	TRANSISTOR 2SC2458				
Q638	8-729-117-54	TRANSISTOR 2SA1175				
Q639	8-729-245-83	TRANSISTOR 2SC2458				
Q640	8-729-117-54	TRANSISTOR 2SA1175				
Q641	8-729-245-83	TRANSISTOR 2SC2458				
Q642	8-729-117-54	TRANSISTOR 2SA1175				
Q643	8-729-117-54	TRANSISTOR 2SA1175				
R101	1-247-131-00	CARBON	1K	5%	1/4W	
R102	1-247-799-00	CARBON	47	5%	1/6W	
R103	1-247-119-00	CARBON	330	5%	1/4W	
R104	1-247-123-00	CARBON	470	5%	1/4W	
R105	1-247-159-00	CARBON	15K	5%	1/4W	
R106	1-247-119-00	CARBON	330	5%	1/4W	
R107	1-247-119-00	CARBON	330	5%	1/4W	
R108	1-247-165-00	CARBON	27K	5%	1/4W	
R109	1-247-119-00	CARBON	330	5%	1/4W	
R110	1-247-129-00	CARBON	820	5%	1/4W	
R111	1-247-159-00	CARBON	15K	5%	1/4W	
R112	1-247-123-00	CARBON	470	5%	1/4W	
R113	1-247-119-00	CARBON	330	5%	1/4W	
R114	1-247-165-00	CARBON	27K	5%	1/4W	
R115	1-247-119-00	CARBON	330	5%	1/4W	
R116	1-247-135-00	CARBON	1.5K	5%	1/4W	
R117	1-247-159-00	CARBON	15K	5%	1/4W	
R118	1-247-119-00	CARBON	330	5%	1/4W	
R119	1-247-165-00	CARBON	27K	5%	1/4W	
R120	1-247-171-00	CARBON	47K	5%	1/4W	
R121	1-247-173-00	CARBON	56K	5%	1/4W	
R122	1-247-159-00	CARBON	15K	5%	1/4W	
R123	1-247-159-00	CARBON	15K	5%	1/4W	
R124	1-247-159-00	CARBON	15K	5%	1/4W	
R125	1-247-171-00	CARBON	47K	5%	1/4W	
R126	1-247-179-00	CARBON	100K	5%	1/4W	
R127	1-247-171-00	CARBON	47K	5%	1/4W	
R128	1-247-171-00	CARBON	47K	5%	1/4W	
R129	1-247-119-00	CARBON	330	5%	1/4W	
R130	1-247-179-00	CARBON	100K	5%	1/4W	
R131	1-247-173-00	CARBON	56K	5%	1/4W	
R132	1-247-171-00	CARBON	47K	5%	1/4W	
R133 ⚠	1-247-109-00	CARBON	120	5%	1/4W	F

ELECTRICAL PARTS

Ref.No.	Part No.	Description				
R134	1-247-145-00	(US,Canadian).....CARBON 3.9K 5% 1/4W				
R134	1-247-151-00	(AEP,G-AEP,UK,E)...CARBON 6.8K 5% 1/4W				
R135	1-247-855-00	CARBON	10K	5%	1/6W	
R136	1-247-139-00	CARBON	2.2K	5%	1/4W	
R137 ⚠	1-247-083-00	CARBON	10	5%	1/4W	F
R138	1-247-121-00	CARBON	390	5%	1/4W	
R139	1-247-115-00	CARBON	220	5%	1/4W	
R141	1-247-141-00	CARBON	2.7K	5%	1/4W	
R142	1-247-135-00	CARBON	1.5K	5%	1/4W	
R143	1-247-135-00	CARBON	1.5K	5%	1/4W	
R144	1-247-149-00	CARBON	5.6K	5%	1/4W	
R145	1-247-149-00	CARBON	5.6K	5%	1/4W	
R146	1-214-757-00	METAL	15K	1%	1/4W	
R147	1-214-745-00	METAL	4.7K	1%	1/4W	
R148	1-247-155-00	CARBON	10K	5%	1/4W	
R149	1-247-155-00	CARBON	10K	5%	1/4W	
R150	1-247-155-00	CARBON	10K	5%	1/4W	
R151	1-247-135-00	CARBON	1.5K	5%	1/4W	
R152	1-247-147-00	CARBON	4.7K	5%	1/4W	
R153	1-247-119-00	CARBON	330	5%	1/4W	
R154	1-247-871-00	CARBON	47K	5%	1/6W	
R155	1-247-107-00	CARBON	100	5%	1/4W	
R161	1-246-477-00	CARBON	1.5K	5%	1/4W	
R162	1-247-147-00	CARBON	4.7K	5%	1/4W	
R164 ⚠	1-247-109-00	CARBON	120	5%	1/4W	F
R201 ⚠	1-247-109-00	CARBON	120	5%	1/4W	F
R202	1-214-753-00	METAL	10K	1%	1/4W	
R203	1-214-753-00	METAL	10K	1%	1/4W	
R204	1-214-760-00	METAL	20K	1%	1/4W	
R205	1-247-151-00	CARBON	6.8K	5%	1/4W	
R206	1-247-125-00	CARBON	560	5%	1/4W	
R207	1-246-545-00	CARBON	1M	5%	1/4W	
R208	1-214-759-00	METAL	18K	1%	1/4W	
R209	1-214-178-00	METAL	82K	1%	1/4W	
R210	1-247-123-00	CARBON	470	5%	1/4W	
R211	1-247-171-00	CARBON	47K	5%	1/4W	
R212	1-247-171-00	CARBON	47K	5%	1/4W	
R213	1-247-173-00	CARBON	56K	5%	1/4W	
R214	1-247-171-00	CARBON	47K	5%	1/4W	
R215	1-247-171-00	CARBON	47K	5%	1/4W	
R216	1-247-871-00	CARBON	47K	5%	1/6W	
R217	1-247-871-00	CARBON	47K	5%	1/6W	
R218	1-246-545-00	CARBON	1M	5%	1/4W	
R219	1-247-163-00	CARBON	22K	5%	1/4W	
R220	1-247-873-00	CARBON	56K	5%	1/6W	
R221	1-247-863-00	CARBON	22K	5%	1/6W	

NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked " ★ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- If there are two or more same circuitsin a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:

- All capacitors are in μF. Common capacitors are omitted. Refer to the following lists for their part numbers. MF:μF, PF:μμF.

COILS

- MMH : mH, UH : μH

SEMICONDUCTORS

In each case, U : μ, for example:
UA···: μA···, UPA···: μPA···, UPC···: μPC, UPD···: μPD···

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

ELECTRICAL PARTS

Ref.No.	Part No.	Description				
R222	1-247-155-00	CARBON	10K	5%	1/4W	
R223	1-247-115-00	CARBON	220	5%	1/4W	
R224	1-247-815-00	CARBON	220	5%	1/6W	
R225 ⚠	1-247-107-00	CARBON	100	5%	1/4W	F
R226 ⚠	1-247-107-00	CARBON	100	5%	1/4W	F
R227 ⚠	1-247-107-00	CARBON	100	5%	1/4W	F
R228 ⚠	1-247-107-00	CARBON	100	5%	1/4W	F
R230	1-214-765-00	METAL	33K	1%	1/4W	
R231	1-214-764-00	METAL	30K	1%	1/4W	
R232	1-214-745-00	METAL	4.7K	1%	1/4W	
R233	1-214-752-00	METAL	9.1K	1%	1/4W	
R235	1-246-545-00	CARBON	1M	5%	1/4W	
R236	1-214-753-00	METAL	10K	1%	1/4W	
R238	1-214-753-00	METAL	10K	1%	1/4W	
R239	1-214-127-00	METAL	620	1%	1/4W	
R240	1-214-727-00	METAL	820	1%	1/4W	
R241	1-214-727-00	METAL	820	1%	1/4W	
R242	1-214-127-00	METAL	620	1%	1/4W	
R243	1-246-545-00	CARBON	1M	5%	1/4W	
R244	1-247-171-00	CARBON	47K	5%	1/4W	
R245	1-247-179-00	CARBON	100K	5%	1/4W	
R246	1-247-179-00	CARBON	100K	5%	1/4W	
R280	1-214-765-00	METAL	33K	1%	1/4W	
R281	1-214-764-00	METAL	30K	1%	1/4W	
R282	1-214-745-00	METAL	4.7K	1%	1/4W	
R283	1-214-752-00	METAL	9.1K	1%	1/4W	
R285	1-246-545-00	CARBON	1M	5%	1/4W	
R286	1-214-753-00	METAL	10K	1%	1/4W	
R288	1-214-753-00	METAL	10K	1%	1/4W	
R289	1-214-127-00	METAL	620	1%	1/4W	
R290	1-214-727-00	METAL	820	1%	1/4W	
R291	1-214-727-00	METAL	820	1%	1/4W	
R292	1-214-127-00	METAL	620	1%	1/4W	
R293	1-246-545-00	CARBON	1M	5%	1/4W	
R301	1-246-535-00	CARBON	390K	5%	1/4W	
R302	1-247-135-00	CARBON	1.5K	5%	1/4W	
R303	1-247-899-00	CARBON	680K	5%	1/6W	
R304	1-247-163-00	CARBON	22K	5%	1/4W	
R305 ⚠	1-247-113-00	CARBON	180	5%	1/4W	F
R306	1-247-155-00	CARBON	10K	5%	1/4W	
R307	1-247-163-00	CARBON	22K	5%	1/4W	
R308 ⚠	1-247-113-00	CARBON	180	5%	1/4W	F
R309	1-247-123-00	CARBON	470	5%	1/4W	
R310	1-247-179-00	CARBON	100K	5%	1/4W	
R311	1-247-131-00	CARBON	1K	5%	1/4W	
R312	1-247-163-00	CARBON	22K	5%	1/4W	

ELECTRICAL PARTS

Ref.No.	Part No.	Description				
R313	1-247-105-00	CARBON	82	5%	1/4W	
R314	1-247-107-00	CARBON	100	5%	1/4W	
R315	1-247-155-00	CARBON	10K	5%	1/4W	
R316	1-247-155-00	CARBON	10K	5%	1/4W	
R317	1-247-131-00	CARBON	1K	5%	1/4W	
R318	1-247-173-00	CARBON	56K	5%	1/4W	
R319	1-247-179-00	CARBON	100K	5%	1/4W	
R320	1-247-143-00	CARBON	3.3K	5%	1/4W	
R321	1-247-179-00	CARBON	100K	5%	1/4W	
R322	1-247-176-00	CARBON	75K	5%	1/4W	
R323	1-246-533-00	CARBON	330K	5%	1/4W	
R324	1-246-533-00	CARBON	330K	5%	1/4W	
R325	1-247-127-00	CARBON	680	5%	1/4W	
R326	1-247-149-00	CARBON	5.6K	5%	1/4W	
R501 ⚠	1-247-097-00	CARBON	39	5%	1/4W	F
R502 ⚠	1-247-107-00	CARBON	100	5%	1/4W	F
R503	1-247-147-00	CARBON	4.7K	5%	1/4W	
R504	1-214-663-00	METAL	1.8	1%	1/4W	
R505	1-214-662-00	METAL	1.6	1%	1/4W	
R506	1-247-179-00	CARBON	100K	5%	1/4W	
R507	1-247-155-00	CARBON	10K	5%	1/4W	
R510 ⚠	1-202-725-00	(US,Canadian)...SOLID	3.3M	10%	1/2W	
R601	1-247-147-00	CARBON	4.7K	5%	1/4W	
R602	1-246-479-00	CARBON	1.8K	5%	1/4W	
R603	1-247-127-00	CARBON	680	5%	1/4W	
R604	1-247-147-00	CARBON	4.7K	5%	1/4W	
R605	1-246-466-00	CARBON	510	5%	1/4W	
		(Serial No. Up to 300200 E model)				
		(Serial No. Up to 500100 AEP model)				
		(Serial No. Up to 600100 UK model)				
		(Serial No. Up to 700300 Canadian model)				
		(Serial No. Up to 800500 US model)				
R606	1-247-125-00	CARBON	560	5%	1/4W	
R607	1-247-131-00	CARBON	1K	5%	1/4W	
R608	1-247-131-00	CARBON	1K	5%	1/4W	
R609	1-247-131-00	CARBON	1K	5%	1/4W	
R610 ⚠	1-247-113-00	CARBON	180	5%	1/4W	F
R611	1-247-157-00	CARBON	12K	5%	1/4W	
R612	1-247-871-00	CARBON	47K	5%	1/4W	
R614	1-247-879-00	CARBON	100K	5%	1/6W	
R616	1-247-871-00	CARBON	47K	5%	1/4W	
R618	1-247-871-00	CARBON	47K	5%	1/4W	
R619	1-247-173-00	CARBON	56K	5%	1/4W	
R620	1-247-163-00	CARBON	22K	5%	1/4W	
R621	1-247-159-00	CARBON	15K	5%	1/4W	
R622	1-246-505-00	CARBON	22K	5%	1/4W	
R623	1-247-143-00	CARBON	3.3K	5%	1/4W	

NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- If there are two or more same circuitsin a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:

- All capacitors are in μF. Common capacitors are omitted. Refer to the following lists for their part numbers. MF:μF, PF:μμF.

COILS

- MMH : mH, UH : μH

SEMICONDUCTORS

In each case, U : μ, for example:
UA···: μA···, UPA···: μPA···, UPC···: μPC, UPD···: μPD···

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

ELECTRICAL PARTS

Ref.No.	Part No.	Description				
R624	1-247-155-00	CARBON	10K	5%	1/4W	
R628	1-247-091-00	CARBON	22	5%	1/4W	
R631	1-247-147-00	CARBON	4.7K	5%	1/4W	
R632	1-247-179-00	CARBON	100K	5%	1/4W	
R633	1-247-811-00	CARBON	150	5%	1/6W	
R641	1-247-879-00	CARBON	100K	5%	1/6W	
R642	1-247-879-00	CARBON	100K	5%	1/6W	
R643	1-247-865-00	CARBON	27K	5%	1/6W	
R644	1-247-879-00	CARBON	100K	5%	1/6W	
R645	1-247-879-00	CARBON	100K	5%	1/6W	
R646	1-246-507-00	CARBON	27K	5%	1/4W	
R647	1-247-879-00	CARBON	100K	5%	1/6W	
R648	1-247-871-00	CARBON	47K	5%	1/6W	
R649	1-246-507-00	CARBON	27K	5%	1/4W	
R650	1-246-513-00	CARBON	47K	5%	1/4W	
R651	1-247-179-00	CARBON	100K	5%	1/4W	
R652	1-246-521-00	CARBON	100K	5%	1/4W	
R653	1-247-165-00	CARBON	27K	5%	1/4W	
R654	1-247-179-00	CARBON	100K	5%	1/4W	
R655	1-247-863-00	CARBON	22K	5%	1/6W	
R656	1-247-171-00	CARBON	47K	5%	1/4W	
R657	1-247-179-00	CARBON	100K	5%	1/4W	
R658	1-247-879-00	CARBON	100K	5%	1/6W	
R659	1-246-513-00	CARBON	47K	5%	1/4W	
R660	1-246-507-00	CARBON	27K	5%	1/4W	
R661	1-246-521-00	CARBON	100K	5%	1/4W	
R662	1-247-879-00	CARBON	100K	5%	1/6W	
R663	1-246-507-00	CARBON	27K	5%	1/4W	
R671	1-247-871-00	CARBON	47K	5%	1/6W	
R672	1-247-171-00	CARBON	47K	5%	1/4W	
R673	1-247-863-00	CARBON	22K	5%	1/6W	
R674	1-247-873-00	CARBON	56K	5%	1/6W	
R675	1-247-863-00	CARBON	22K	5%	1/6W	
R676	1-247-855-00	CARBON	10K	5%	1/6W	
R677	1-247-873-00	CARBON	56K	5%	1/6W	
R678	1-247-169-00	CARBON	39K	5%	1/4W	
R679	1-247-873-00	CARBON	56K	5%	1/6W	
R680	1-247-179-00	CARBON	100K	5%	1/4W	
R681	1-246-529-00	CARBON	220K	5%	1/4W	
R682	1-247-879-00	CARBON	100K	5%	1/6W	
R683	1-247-883-00	CARBON	150K	5%	1/6W	
R684	1-247-131-00	CARBON	1K	5%	1/4W	
R685	1-247-141-00	CARBON	2.7K	5%	1/4W	
R686 ⚠	1-247-123-00	CARBON	470	5%	1/4W	F
R687	1-247-155-00	CARBON	10K	5%	1/4W	

ELECTRICAL PARTS

Ref.No.	Part No.	Description
R901	1-214-859-00	METAL 620 1% 1/2W
R951	1-214-859-00	METAL 620 1% 1/2W
RT101	1-226-236-00	RES, ADJ, CARBON 10K (MUTING WIDE)
RT102	1-226-236-00	RES, ADJ, CARBON 10K (MUTING NARROW)
RT151	1-226-238-00	RES, ADJ, CARBON 50K (FM AGC)
RT152	1-226-237-00	RES, ADJ, CARBON 20K (FM METER LEVEL)
RT201	1-226-741-00	RES, ADJ, METAL GLAZE 50K (PILOT CANCEL)
RT202	1-230-473-11	RES, ADJ, METAL GLAZE 200K (R-L SEPARATION)
RT203	1-228-505-00	RES, ADJ, METAL GLAZE 10K (VCO)
RT252	1-230-473-11	RES, ADJ, METAL GLAZE 200K (L-R SEPARATION)
RT301	1-226-238-00	RES, ADJ, CARBON 50K (AM METER)
RT601	1-226-233-00	RES, ADJ, CARBON 1K (GATE VOLT)
RT602	1-226-238-00	RES, ADJ, CARBON 50K (AM AUTO STOP)
RT603	1-226-239-00	RES, ADJ, CARBON 100K (CAL TONE)
S801	1-553-739-21	SWITCH, KEY BOARD (1)
S802	1-553-739-21	SWITCH, KEY BOARD (2)
S803	1-553-739-21	SWITCH, KEY BOARD (3)
S804	1-553-739-21	SWITCH, KEY BOARD (4)
S805	1-553-739-21	SWITCH, KEY BOARD (5)
S806	1-553-739-21	SWITCH, KEY BOARD (6)
S807	1-553-739-21	SWITCH, KEY BOARD (7)
S808	1-553-739-21	SWITCH, KEY BOARD (8)
S809	1-553-739-21	SWITCH, KEY BOARD (TUNING -)
S810	1-553-739-21	SWITCH, KEY BOARD (TUNING +)
S811	1-554-303-00	SWITCH, KEY BOARD (TUNE MODE)
S812	1-554-303-00	SWITCH, KEY BOARD (HI-BLEND)
S813	1-554-303-00	SWITCH, KEY BOARD (IF BAND)
S814	1-554-303-00	SWITCH, KEY BOARD (FM/AM)
S815	1-554-303-00	SWITCH, KEY BOARD (CAL TONE)
S816	1-554-303-00	SWITCH, KEY BOARD (MUTING/MODE)
S817	1-554-303-00	SWITCH, KEY BOARD (SCAN READ)
S818	1-554-303-00	SWITCH, KEY BOARD (MEMORY SET)
S901 ⚠	1-553-318-00	SWITCH, PUSH (AC POWER)(1 KEY)(POWER)
S902	1-552-625-00	SWITCH, SLIDE (PROGRAM)
S903	1-554-165-00	(US,Canadian,E)...SWITCH, SLIDE(10K/9K)
S904 ⚠	1-526-576-51	(E)....SELECTOR, POWER VOLTAGE
X601	1-567-125-00	VIBRATOR, CRYSTAL

NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked " ★ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- If there are two or more same circuitsin a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:

- All capacitors are in μF. Common capacitors are omitted. Refer to the following lists for their part numbers. MF:μF, PF:μμF.

COILS

- MMH : mH, UH : μH

SEMICONDUCTORS

In each case, U : μ, for example:
UA···: μA···, UPA···: μPA···, UPC···: μPC, UPD···: μPD···

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.